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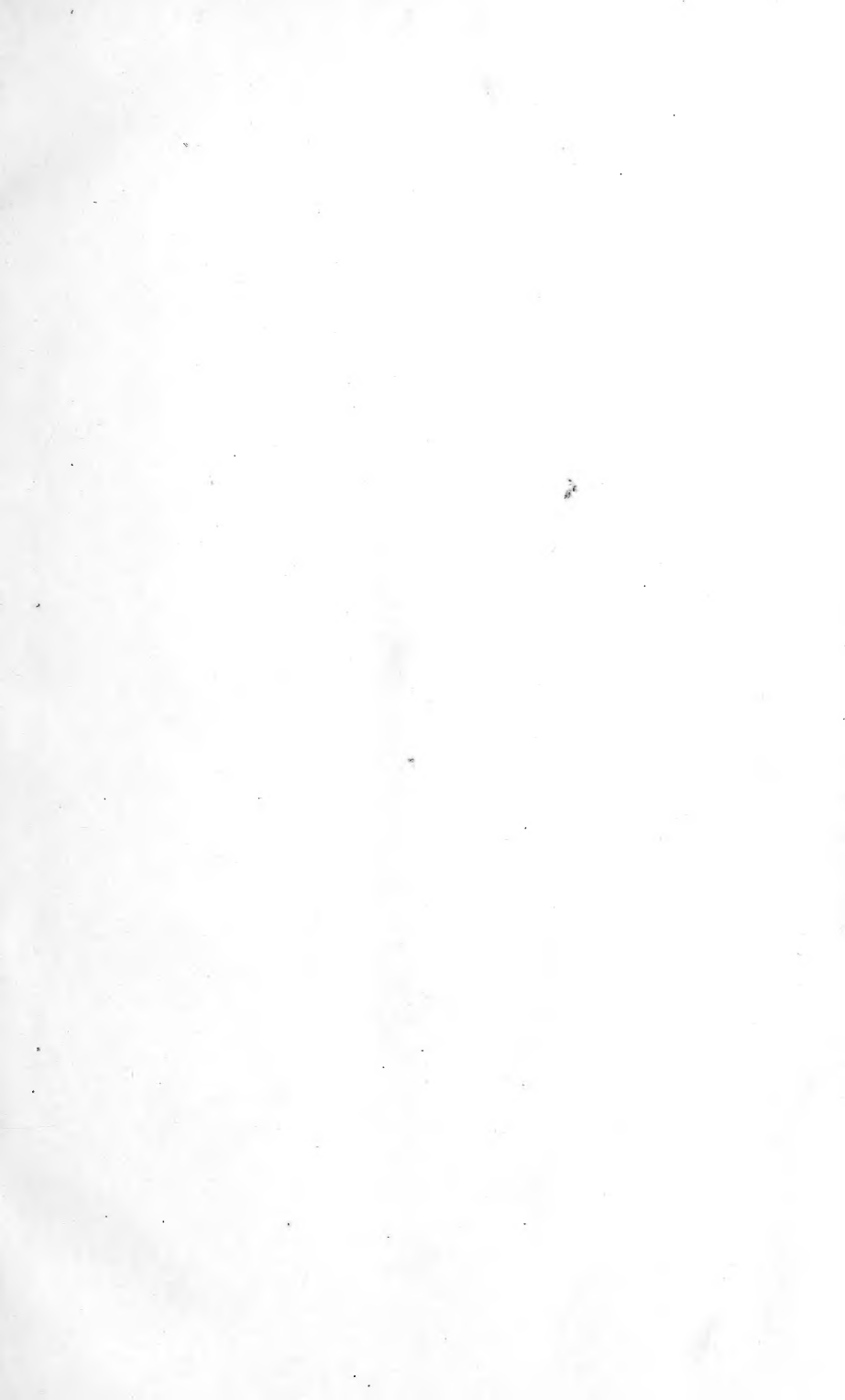
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THE
VICTORIAN NATURALIST:

THE JOURNAL & MAGAZINE

OF THE

Field Naturalists' Club of Victoria.

VOL. XVII.

MAY, 1900, TO APRIL, 1901.

Hon. Editor: MR. F. G. A. BARNARD.

The Author of each Article is responsible for the facts and opinions recorded.

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ERRATA.

Pages 114, 115—For “*Dromaius*” read “*Dromæus*.”

Page 147, line 2—For “Leach” read “Pennant.”

Page 157, line 19—For “*Streptachne*” read “*Stipa*.”

Page 170, line 29—Insert “Descriptive Catalogue of” before “Nests and Eggs.”

Page 190, line 1—For “micro-photographic” read “photo-micro-graphic.”

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MAY, 1900.

The Victorian Naturalist:

THE JOURNAL AND MAGAZINE

— OF —

The Field Naturalists' Club of Victoria.

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1900.

Field Naturalists' Club of Victoria.

ROOMS—ROYAL SOCIETY'S HALL, VICTORIA ST., MELBOURNE.

BUSINESS PAPER FOR MONTHLY MEETING.

Monday, 14th May, 1900, at Eight p.m.

1. Correspondence and Reports.

2. Nominations for Membership.

Members making nominations will oblige by handing the full name and address to Hon. Secretary.

3. General Business.

4. Reading of Papers and Discussions thereon.

(Authors are requested to hand in a brief resume of their papers to the Secretary.)

1. By Mr. J. H. Maiden, F.L.S. (communicated by Mr. F. G. A. Barnard).
"Some Notes of a Trip to the Victorian Alps."
2. By Mr. R. Hall, "Field Notes on (a) *Hirundo neoxena*, Gld., (b) *Pachycephala gutturalis*, Lath."

5. Reading of Natural History Notes.

Members who may note any unusual occurrence, or see anything of interest in Foreign or Colonial papers, are requested to inform the Secretary of the same that he may arrange for their bringing them before the meeting; such notes should, however, be brief.

6. Exhibition of Specimens and Conversazione.

Members exhibiting specimens are requested to furnish the Hon. Secretary with written particulars of their Exhibits for record in Minutes and *Naturalist*.

* EXCURSION. *

THURSDAY, MAY 24 (Queen's Birthday).—Somerton. Under the leadership of Mr. T. S. Hall, M.A. Geology. Meet at Flinders Street Station 10.20 a.m. Programme.—Take 10.25 a.m. train to Somerton, *via* Essendon and Broadmeadows; walk to Aitken's Hill (volcanic), 2 miles; return to Broadmeadows Station *via* Moonee Ponds Creek (fossils)—about 6 miles; return by 4.50 p.m. train from Broadmeadows.

THE

Victorian Naturalist.

VOL. XVII.—No. 1. MAY 10, 1900.

No. 197.

FIELD NATURALISTS' CLUB OF VICTORIA.

THE ordinary monthly meeting of the Club was held in the Royal Society's Hall on Monday evening, the 9th April, 1900, when the president, Mr. J. Shephard, occupied the chair, and and about 45 members and visitors were present.

REPORTS.

A report of the excursion to Heidelberg on Saturday, 17th February, was read by the leader, Mr. J. Shepherd, who referred at length to some of the captures made, and by means of diagrams demonstrated the anatomy of a Pedalion found, which is likely to prove a new species.

A report of the excursion to Point Cook, on Saturday, 7th April, was read by the leader, Mr. R. Hall, who stated that the afternoon had been devoted to ornithology. A number of waders were seen along the banks of the lagoons, but the best capture of the day was a phase of the Grass-bird, *Megalurus gramineus*, Gould, which showed considerable differences from a typical specimen.

Owing to unfavourable weather, the dredging excursion, arranged for Saturday, 24th March, at Brighton, was not held.

The hon. librarian reported the following additions to the Club's library :—"Handbook to the Birds of Australia," J. Gould, 2 vols., and "Cambridge Natural History—Worms, &c.," purchased ; "With a Southern Field Club," by H. S. Dove, F.Z.S., Launceston, Tasmania, from the author ; "Catalogue of Australian Coccidæ," by Jas. Lidgett, from the author ; "Catalogue of Scientific and Technical Periodicals in the Melbourne Libraries," by T. S. Hall, M.A., from the Trustees Public Library of Victoria ; "Proceedings Linnean Society of New South Wales," 1899, part 3, from the Society ; "Proceedings Royal Geographical Society of Australasia (Victorian Branch)," 1899, from the Branch ; "Journal of Mueller Botanical Society," Perth, W.A., vol i., parts 1 and 5, from the Society ; "Monthly Progress Reports—Geological Survey of Victoria," Nos. 6 and 7 ; and "Notes on Fossil Flora of South Gippsland (Victorian Coalfields Reports, No. 7)," by Jas. Stirling, Government Geologist, from the Department of Mines, Victoria ; "Bulletin Department of Agriculture, Victoria," 16 parts, from the Department ; "Bulletin Department of Agriculture, Queensland," 11

parts : "Annual Report, Department of Agriculture, Queensland," 1898-99, and *Queensland Agricultural Journal*, vol. vi., parts 1, 2, 3, from the Department of Agriculture, Brisbane.

ELECTION OF MEMBERS.

On a ballot being taken, Professor J. W. Gregory, D.Sc., F.G.S., University, and Mr. W. Heber Green, M.Sc., Surrey Hills, were unanimously elected members of the Club.

GENERAL BUSINESS.

On the motion of Messrs. D. Le Souëf and C. French, F.L.S., the hon. secretary was directed to forward the congratulations of the Club to Mr. Borchgrevink and the members of the Antarctic Expedition on their safe return to Hobart.

PAPERS READ.

1. By Mr. T. S. Hall, M.A., entitled "A Decapitated Valley."

The author drew attention to the course of a stream near Lorne, which was now in an entirely different direction to that it had taken in comparatively recent times, the alteration having been effected by the wearing away of the rocks.

The President and Messrs. Sayce and Gabriel joined in the discussion that followed.

2. By Mr. H. T. Tisdall, entitled "A Trip to Anglesea River."

The author described a recent visit to Anglesea River, noting the various plants seen, and exhibited some of the more important in illustration of his remarks. He stated that he had spent some time in endeavouring to find out if the orchid *Dipodium* is really parasitic on the roots of other plants, but had not succeeded.

In discussing the paper, Mr. C. French, F.L.S., stated that he had artificially grown the orchid *Dipodium punctatum*, and could say that it was not parasitic.

3. By Mr. R. Hall, entitled "Extension of Range of Some Australian Birds."

The author gave a list of birds which had recently been added to the avifauna of Western Australia, with some explanatory remarks.

Messrs. Le Souëf, French, Hogg, and Keartland discussed the paper.

4. By Mr. W. R. Guilfoyle, F.L.S., communicated by Mr. H. T. Tisdall, entitled "A New Species of *Bursaria*," was taken as read.

The author described and gave the name *Bursaria pantoni* to a shrub or small tree which had hitherto been regarded as a variety of *Bursaria spinosa*.

NATURAL HISTORY NOTES.

Mr. H. T. Tisdall drew attention to the extraordinary growth of *Azolla* in the Botanical Gardens, whereupon Mr. C. French,

F.L.S., traced the history of this plant at the Gardens from about 1860.

Mr. F. G. A. Barnard asked if the American pest, known as "Water Hyacinth," was still spreading in the Gardens?

Mr. C. French, jun., replied that it had all been taken out.

Mr. J. H. Gatliff mentioned that, with reference to the question raised at the last meeting as to the weight of the shells Hermit Crabs could move about, he had weighed the two largest shells he had found Hermit Crabs inhabiting, with the result that a shell of *Voluta mammillata*, $8\frac{1}{4}$ ozs., was heaviest; others were *Litorium australis*, $6\frac{3}{4}$ ozs.; *Voluta fusiformis*, 6 ozs.; and *V. papillosa*, 4 ozs.

EXHIBITS.

Mr. F. G. A. Barnard. — Fungus, *Schizophyllum commune*, Fries., growing on dead Laburnum. By Mr. C. French, F.L.S.—Painting of *Dacelo gigas*. By Mr. Jas. A. Kershaw.—Three specimens of Twelve-wired Bird of Paradise, *Seleucides nigricans*, New Guinea—two immature males showing change in plumage, one female. By Mr. D. Le Souëf.—Three skins of *Craspedophora alberti*, Albert Rifle-bird, showing change of plumage in male. By Mr. D. M'Alpine.—Oyster fungus, *Pleurotus ostreatus*, phosphorescent, found at Beaumaris, 6th April, 1899. By Mr. F. M. Reader.—Dried specimens of the grass *Stipa teretifolia*, Stendel, new for N.W. of Victoria, and *Schoenus humilis*, Benth., new for Victoria. By Mr. H. T. Tisdall.—Coloured drawings of *Dipodium punctatum* and *Orthoceras strictum*; also dried specimens of *Cryptandra vexillifera*, *Alyxia buxifolia*, *Calocephalus brownii*, and thirteen other flowering plants, also six seaweeds, in illustration of his paper.

After the usual conversazione the meeting terminated.

EXCURSION TO HEIDELBERG.

THE excursion to Heidelberg, adjourned from the preceding week, took place on Saturday, the 17th February. A fair number of members attended, including a representative of the botanists of the Club, Mr. H. T. Tisdall, who devoted himself to collecting water-plants, and has furnished a short note on those obtained.

The crescent-shaped pool near "Springbank" was first visited, and though yielding but few of the colonial forms of Rotifera, so plentiful at the corresponding period of last season, supplied the visitors with several interesting water-plants, the Freshwater Mussel, *Unio* (sp.), and some attached clusters of the rotifer *Lacinularia pedunculata*. Some free-swimming colonies were also observed, and were too hastily put aside as probably *L. natans*, a form very commonly found. A visit a month later procured colonies which, on examination, proved to be a species of

the genus *Conochilus*, most probably undescribed. This later visit was induced by the discovery of a species of *Pedalion*. This interesting rotifer when first discovered by Dr. Hudson necessitated the creation of the order Scirtopoda, and now there are only two genera known, *Pedalion* and *Hexarthra*, containing respectively two and one species. *Pedalion* is mentioned as very rare. It has been noted by members of the Club previously, but only in small numbers. Subsequent visits have proved the "Springbank" pool to swarm with *Pedalion* for a period of six weeks. As is well known, the chief interest of this form is that, while possessing the most distinctive anatomical features of a rotifer, it is furnished with six limbs, controlled by a remarkably developed muscular system, and each provided with tufts of plumose setæ almost precisely resembling those possessed by members of the class Crustacea, such as are found in the orders Cladocera and Copepoda. The *Pedalion* found differs from the two described species, and further study of it may possibly show that its peculiarities entitle it to rank as a distinct species.

The lagoon near the bridge over the Yarra was examined on the way back, and was found covered with *Lemna* and *Azolla*. The gathering from this pool, though hastily made, proved productive of an assemblage of forms of Rotifera so diverse in their anatomy that they might well have been selected as illustrative of the great variations in form characteristic of the group: *Notops clavulatus*, sac-like, soft-bodied, and transparent; *Rotifer macrurus*, short and worm-like; *Acinurus neptunius*, swimming about like the common *Rotifer vulgaris* until some unknown stimulus provoked the extension of its twelve-jointed telescopic foot, thus increasing its length five-fold, and revealing a curious tripod of toes; *Notens quadricornis*, displaying an oval sculptured and tessellated lorica, furnished at either extremity with projecting spines; the beautifully translucent *Pterodina palina*, with a flattened lorica; *Diglena biraphis*, representing the illoricate free swimmers; *Brachionis bakeri*, a loricate species so variable in the developments of its chitinous armour that Mr. Rousselet has been able to demonstrate the existence of a gradation so evenly stepped that some seven or eight specific names are wiped out, and the forms reduced to varieties of the one species. Finally, *Salpina eustala*, possessing a compressed lorica, with a curious groove running down its arched back. Mr. Tisdall succeeded in identifying a number of aquatic plants, and exhibits specimens preserved in formalin. He says:—"On the surface of the backwater floated a number of water lilies, *Ottelia ovalifolia*, the beautiful white blossoms contrasting well with their pretty oval leaves. The water near the bridge was completely covered as with a green carpet with the tiny Duck-weed, *Lemna minor*, interspersed here and there by small brownish patches of *Azolla filiculoides*. In both

waters were to be seen *Myriophyllum verucosum*. On the edges a few plants of *Nitella gelatinosa* were collected, but they had no fruit. By means of our leader's spoon apparatus some blue-green plants were lifted off the muddy bottom; they turned out to be two species of *Oscillatoria*, *Lingbya stagnina* and *Calothrix confervicola*."

J. SHEPHARD.

NOTES ON AUSTRALIAN DRAGON-FLIES.

By F. L. BILLINGHURST.

(Communicated by T. S. Hall, M.A.)

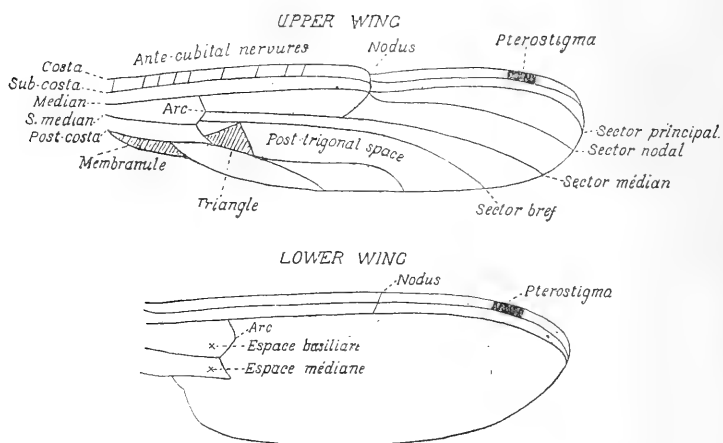
(Read before the Field Naturalists' Club of Victoria, 13th Nov., 1899.)

LAST summer, at the request of M. René Martin, a French entomologist, who is a specialist on the Odonata (Dragon-flies), I collected a number of the species occurring in this district (*Alexandra*), and forwarded them to him for purposes of study. As the collecting of a certain order of insects naturally excites some amount of interest in that order, I asked M. Martin to forward me some literature on the subject, but he replied that virtually there was none, but in order to afford me some help he wrote out a few notes on the classification, &c., of the Odonata. These were not intended for publication, and are somewhat incomplete, but it having been represented to me that they might be of use to Victorian entomologists I have made a translation of the part referring to the Australian genera. Later on, when I get some further particulars I have written for, I propose to compile a list of the species of *Alexandra*, some 40 in number, with short descriptions by which they can be recognized.

The general appearance of a Dragon-fly is well known and requires little description, but a few characteristics may be mentioned.

The abdomen is comparatively long and slender, and consists of ten segments, counting from the thorax, and an anal tubercle, terminated in the male by three or four appendages, two superior, and one or two inferior; in the female by two appendages only. The genital organs of the male are situated on the second segment of the abdomen.

The wings are strongly veined, and as the venation serves largely towards the classification of the families and genera, the enlarged diagram given of two typical wings will be useful. Five large veins proceed from the base of each wing, the anterior or first is the costa, the second the sub-costa, then the median, the sub-median, and the post-costa.



In the classification usually adopted the group Odonata is divided into three families, which are subdivided into seven sub-families, according to the following table :—

Family I.—LIBELLULIDÆ. Sub-family 1. Libellulinæ.

II.—ÆSCHNIDÆ.

III.—AGRIONIDÆ.

2. Cordulinæ.
3. Gomphinæ.
4. Cordulegastrinæ.
5. Æschninæ.
6. Calopteryginæ.
7. Agrioninæ.

The distinguishing characters of these families and sub-families are as follow :—

Wings dissimilar in shape. Triangles of the anterior wings very different to those of the posterior pair. Three anal appendages in the male ...

I.—LIBELLULIDÆ.

Eyes simple, without prolongation at the bottom (*au bordé postérieur*)

1. Libellulinæ.

Eyes large, contiguous, having a kind of prolongation at the bottom

2. Cordulinæ.

Triangles of the wings almost alike, but wings not alike. Three anal appendages in the male

II.—ÆSCHNIDÆ.

Eyes separated one from the other

3. Gomphinæ.

Eyes almost touching

4. Cordulegastrinæ.

Eyes contiguous, very large

5. Æschninæ.

Wings alike in shape, eyes projecting and more widely separated. The triangle of the wings becomes a quadrangle III.—AGRIONIDÆ.

Ante-cubital nervures more or less numerous between the base and nodus of the wings, between the costa and the median ... 6. Calopteryginæ.

Ante cubital nervures always two only, between the costa and subcosta, before the nodus ... 7. Agrioninæ.

The following are the known Australian genera, with notes on some of the species :—

FAMILY I.—LIBELLULIDÆ.

SUB-FAMILY I.—LIBELLULINÆ.

GENUS.	
THOLYMIS	... One species only, <i>Tholymis tillarga</i> .
PANTALA	... One species only, <i>Pantala flavescentis</i> . Very common.
TRAMEA	... Four or five Australian species.
RHYOTHEMIS	... Three or four Australian species.
NEUROTHEMIS	... <i>N. fluctuans</i> , <i>N. oculata</i> , and <i>N. oligoneura</i> .
DIPLAX ...	... <i>D. melanopsis</i> , <i>D. bipunctata</i> , <i>D. rubra</i> , <i>D. hæmatodes</i> .
TRITHEMIS	... Much resembles <i>Diplax</i> , but the ante-cubital nervures are more numerous.
TETRATHEMIS	... Resembles <i>Trithemis</i> , but the triangle of the upper wings has four sides, and becomes a quadrangle instead of a triangle.
ORTHETRUM	... Four or five species of fairly large size, red or blue. <i>O. caledonicum</i> received from Mr. Billingham, old male blue, female yellowish. <i>O. oblitum</i> is red, the female yellow. The other species are also yellow, brown, or red, same size, or else yellow spotted with black.
AGRIONOPTERA	... Several species.
NEOXENIA	... Resembles <i>Agrionoptera</i> , but species smaller.
BRACHYMESIA	... Resembles <i>Agrionoptera</i> , but species smaller.
NANNODIPLAX	... Very small size.
NANNODYTHEMIS	... Very small size, triangle becomes a quadrangle.

SUB-FAMILY 2.—CORDULINÆ.

- HEMICORDULIA ... Four or five species. Abdomen elongated. Metallic green, with yellow spots. Received from Mr. Billingham—*H. tau*, with letter T on the head; *H. australiae*, the appendages of the male without a tooth; *H. novæ-hollandiæ*, the appendages of the male with a tooth.
- SYNTHESIS ... Nine remarkable species, differing from *Hemicordulia* because the basal space is reticulated. Abdomen long, more or less green or yellow.
- SOMATOCHLORA ... *S. jacksoniensis*.
- CORDULEPHYA ... This genus is distinguished by the triangle of the upper wings becoming a quadrangle.

FAMILY II.—ÆSCHNIDÆ.

SUB-FAMILY 3.—GOMPHINÆ.

- HEMIGOMPHUS ... The six or seven species of Australia are all black and yellow, and much resemble each other.

SUB-FAMILY 4.—CORDULEGASTRINÆ.

- PETALURA ... One special species in Australia, of very large size.

SUB-FAMILY 5.—ÆSCHNINÆ.

- ACANTHOÆSCHNA ... Two species of very large size, very rare. Black and yellow, with the thorax brown with yellow rays.
- TELEPHLEBIA ... One very beautiful species, large, rare, remarkable as having the wings spotted with black or brown.
- GYNOCANTHA ... Seven or eight species.
- ÆSCHNA ... *Æ. brevistyla*.
- ANAX ... *A. papuensis*.
- AUSTROÆSCHNA ... Several species.

FAMILY III.—AGRIONIDÆ.

SUB-FAMILY 6.—CALOPTERYGINÆ.

- DIPHLEBIA ... Sole genus of Australia.

SUB-FAMILY 7.—AGRIONINÆ.

- LESTES ... Very common.
- ARGIOLESTES ... Three species, resembling each other.
- SYNLESTES ... One species, brilliant metallic-green.

XANTHAGRION	...	Common.
NOSOSTICTA	...	N. solida. Base of wings generally yellowish, sometimes not.
ALLONEURA	...	Very like Nososticta, with some differences of reticulation.
ISOSTICTA	...	I. simplex, long abdomen, small head.
PSEUDAGRION	...	A new species received.
IDIOCNEMIS	...	Two remarkable species, small, outer edge of wings dentated.
ISCHNURA	...	Several species.
AGRIOCNEMIS	...	Three species in Australia, very small size.
HEMIPHLEBIA	...	Very small, rare.
TELEBOSIS	...	Two or three species.

DESCRIPTIONS OF NEW VICTORIAN COCCIDÆ.

By E. ERNEST GREEN, F.E.S., Government Entomologist, Ceylon.
(Communicated by F. G. A. Barnard.)

(*Read before the Field Naturalists' Club of Victoria, 12th February, 1900.*)

THE following new species of Coccidæ were collected by Mr. Jas. Lidgett, of Myrning, Victoria, and forwarded to me for identification and description. I am indebted to Mr. Lidgett for the notes on the habits, &c., of the living insects.

FAMILY—COCCIDÆ.

SUB-FAMILY DIASPINÆ.

MYTILASPIS BICORNIS, Green and Lidgett, n. sp.

Female puparium reddish brown, paling to white at posterior extremity. In some examples the white area is much broader and more conspicuous than in others. Form normal, dilated behind, often irregularly contorted. Length, 1.50 to 2 mm.

Adult female of normal form, narrowest in front, broadest across the abdominal segments. Antenna consisting of a small chitinous tubercle, with a longish stout curved hair and a small point on one side. Parastigmatic glands at anterior spiracles only, consisting of usually two orifices. In many specimens, but not in all, a pair of large circular pores is noticeable on the median dorsal area of the meso- and metathorax. Pygidium (fig. 1) broadly rounded, lobes rather small, often scarcely projecting beyond the margin; median pair simple, extremity broad and slightly rounded, without any indentations or crenulations; second pair bifid, the cusps pointed, the mesal cusp largest; other lobes obsolete. Beyond the lobes on each side are three or four small chitinous prominences, each bearing two minute pointed processes, scarcely if at all projecting beyond the margin, situate on the ventral surface, a large semilunar pore

with conspicuously thickening rim being accurately superimposed dorsally above each of the ventral prominences. There are numerous conspicuous oval pores along the margin, and in more or less linear series on the dorsal surface of all but the cephalic and prothoracic segments. Circumgenital glands in five groups; 4 to 6 pores in the median group, 9 to 13 in the upper laterals, and 12 to 15 in the lower laterals. Length, about 1 mm.

Male puparium dull white; pellicle yellowish; ventral scale well developed, completely enclosing the insect. Length, 1.25 mm.

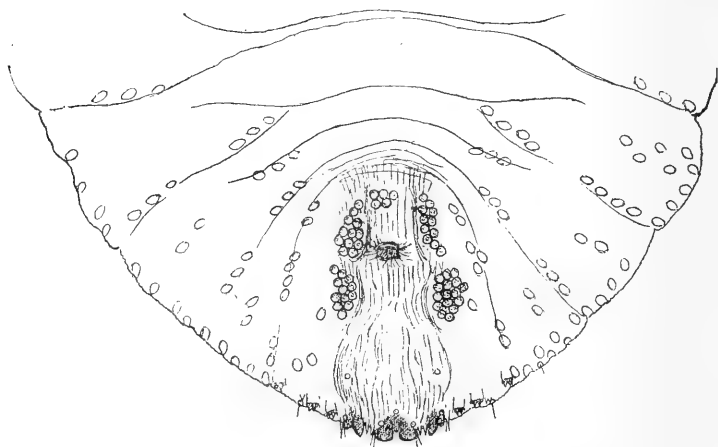


Fig. 1.—Pygidium of *Mytilaspis bicornis*, Green and Lidgett.
(Much enlarged.)

Habitat.—On the bark of *Eucalyptus globulus*, the males apparently affecting the younger branches. Collected at Myrniong, Victoria.

Probably a native of Tasmania, and may have been imported on young plants of *Eucalyptus globulus*.

FIORINIA LIDGETTI, n. sp.

Female puparium small, narrow oblong. First pellicle very pale straw colour; second pellicle reddish fulvous, entirely concealed by a thin but compact coat of white secretion. Length, 1.25 mm. Breadth, 0.50 mm.

Male puparium very similar in external appearance to that of female, but rather whiter; posterior extremity broader; a very indistinct median carina. Length, 1 mm.

Adult female occupying as usual the cavity of the second pellicle; oblong; broadest across the abdominal segments. Mouth parts rather large. Dorsal surface (particularly on mesothorax), with numerous small oval pores connected with short

capitate spinneret ducts. Pygidium without either lobes or squames. Dorsal series of spines rather long and conspicuous, with thickened bases. Ventral series minute. A marginal dorsal series of 4 or 5 oval pores with conspicuously thickened rims, in connection with cylindrical ducts. Circumgenital glands in five distinct groups, the median group consisting usually of only 2 orifices, upper and lower lateral groups each with 4 or 5. Anal anterior to genital orifice. The median dorsal area of pygidium rather distinctly longitudinally striated. Length, after oviposition, about 0.50 mm.

The second pellicle, which constitutes the principal part of the puparium, has, at the posterior extremity, a median pair of lobes, their inner edges straight and contiguous, the free edge sloping and notched. In older examples the two lobes seem to be almost continuous, together forming a semicircle.

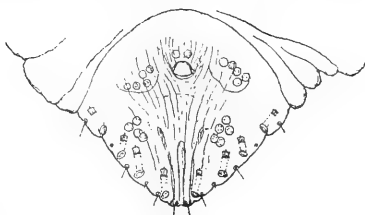


Fig. 2.—Pygidium of *Fiorinia lidgetti*, Green. Adult female.
(Much enlarged.)

Habitat.—On *Acacia decurrens*, Myrniong, Victoria, Australia. Collected by Mr. James Lidgett, whose name I have taken the liberty of utilizing for the species.

A peculiarity of the species is the manner in which the scales are disposed, transversely, on the bark of the plant. Maskell notes the same habit in his *F. acaciæ*, but in that species the second pellicle is deep black, and the pygidium of the adult female is said to have "a single median floriated lobe." In examples of *F. acaciæ* that I have examined the median lobe might be more correctly described as bicuspid, the cusps divergent (*vide* fig. 3).



Fig. 3.—Abdominal Extremity of *Fiorinia acaciæ*, Mask. (Much enlarged.)

F. expansa, Mask., *casuarinæ*, Mask., *signata*, Mask., *tenuis*, Mask., and *bambusæ*, Mask., are all without lobes on the

pygidium, but are readily distinguishable from the present species by other prominent characters. *F. expansa* and *casuarinæ* have no circumgenital glands; *signata* has the female puparium widely pyriform and a large number of orifices in the circumgenital glands; *tenuis* has "numerous rather strong and thick spines" on the margin of the pygidium; and *bambusæ* has a "very long and excessively slender puparium."

A very plentiful species, literally covering the trunk and branches of *Acacia decurrens*, the male scales being usually placed on the leaves, and look very much like a *Mytilaspis*. Specimens have also been observed affecting *A. melanoxylon* and *A. armata*.

SUB-FAMILY LÉCANINÆ.

ERIOCHITON (?) MELALEUCÆ, n. sp.

Test of adult female similar in structure to that of *E. cajani*, Mask., but narrower and more oblong; compact, glassy or waxy, brittle, roughened with numerous irregular waxy granules, which give it the appearance of being closely set with grains of white quartz sand. The test completely encloses the insect, leaving an oval aperture above the anus. Length, 4.25 mm.; breadth, 2 mm.; height, rather less than 2 mm.

Test of male not observed.

Adult female oblong oval; moderately convex, with a complete marginal series of pointed conical spines (smaller and not so sharply pointed as those of *cajani*). At each stigmatic cleft is a long curved spine. Antenna with eight joints, of which the third is the longest and the eighth the shortest; several stout curved hairs on the terminal joint, and one or two finer hairs on the other joints, that on the second joint being particularly long. Legs well developed, rather stout. Foot with the usual four digitules; the unguals broadly spatulate; the tarsals fine knobbed hairs. During the period of oviposition the hinder (abdominal) parts of the insect are turned sharply upwards at right angles to the rest of the body and become fixed in that position. The derm on this abdominal area is not so strongly chitinous as on the anterior parts. There is on each side of the abdomen a series of scars somewhat resembling spiracles, but apparently not functional, each scar surrounded by concentric chitinous lines. Derm with a few scattered small circular pores on the dorsal surface. Anal ring with six stout hairs. Anal lobes irregularly triangular, the apex bluntly rounded and incurved. Long, 3 mm.; broad, 1.50 mm.

Habitat.—On *Melaleuca nodosa* (introduced), Myrniong, Victoria, Australia.

This species is very closely allied to *E. cajani*, recorded by Maskell from India, where it occurs on several papilionaceous plants. The present species differs from *cajani* chiefly in the

more oblong form of both the test and the adult female, and in the size and shape of the marginal spines. It affects also quite a different order of plants.

This is the first species of *Eriöchiton* recorded from Australia. Two species occur in New Zealand.

SUB-FAMILY COCCINÆ.

DACTYLOPIUS AUSTRALIENSIS, Green and Lidgett, n. sp.

Judged by the antennal formula only, it might be assigned to *Dactylopius globosus*, Mask., which also affects various species of *Acacia*, but other general characters show it to be quite distinct. The test of *globosus* is very much larger, firmer, and more compact than that of the present species. There is a very marked difference in the proportionate size of the legs in the two species. While the adult female of *globosus* is more than twice as large, its legs are much smaller than those of the insect now under consideration.

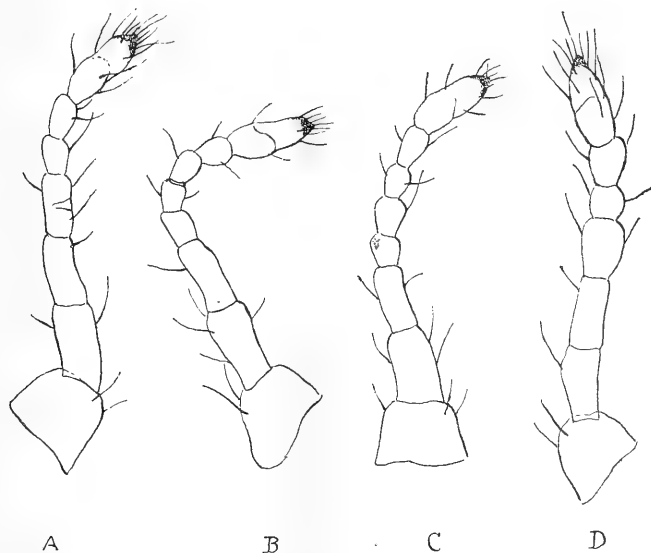


Fig. 4.—Antennæ of *Dactylopius australiensis*, Green and Lidgett.
(Much enlarged.)

There is a considerable variety in the antennal formula. The normal number of joints seems to be 8, though in a large percentage of the specimens joints 4 and 5 are confluent, the divisions being incomplete and sometimes even altogether absent. In some examples the joints are distinct in one antenna and fused in the other. The terminal (8th) joint also shows a

tendency to division. The apex of this terminal joint takes the stain very deeply. The 5th and 6th are always markedly narrower than the preceding joints. The most commonly repeated formula is :—

A.—8 (1, 2), 3, (4, 5, 6, 7), 4 and 5 being more or less confluent.

Other varieties are :—

B.—(8, 1, 2), 3, 4, (5, 6, 7).

C.—8 (1, 2), 3 (5, 7), (4, 6).

And in an example where the division between 4 and 5 is completely suppressed, reducing the number of antennal joints to 7, the formula reads :—

D.—7 (1, 2), 3, 4 (5, 6).

Anal ring with 6 stout hairs.

Foot with 4 digitules, all fine knobbed hairs, those on tarsus longest; the unguals reaching only slightly beyond tip of claw. Tarsus very short, about $\frac{1}{3}$ length of tibia. Tibia rather less than $\frac{3}{4}$ length of femur and trochanter together.

Average length of insect, 2.50 mm.

The adult female is partly enclosed in a mass of pure white cotton, subglobular in shape, deeply and distinctly segmented.

This insect threatens to become a very serious pest to *Acacia dealbata*. It has already killed many trees, and other trees about Myrning are simply alive with the larvæ, which are active and crawl about in great companies, the ground underneath the trees in many instances being quite white.

[Since the above paper was read Mr. Lidgett has received a communication from Mr. E. Ernest Green, in which he says he is disposed to separate *Eriochiton melaleuceæ* and *E. cajani* from the genus *Eriochiton* and include them in Cockerell's genus *Ceroplastodes*.—ED. *Vict. Nat.*]

THE NATIONAL MUSEUM OF VICTORIA.

ACTING on the suggestion of the editor of the *Naturalist*, I am glad to have the opportunity of laying before its readers the following brief account of the changes which are now being made in regard to the National Museum buildings and the collection of objects of natural history which had been brought together by the late Sir F. M'Coy.

As is well known to all of us who have taken any interest in this institution, the building hitherto devoted to the display of the collection has been quite inadequate in size for this purpose, nor did it appear possible to sufficiently extend it upon the limited site allotted to the Museum in the University grounds. Added to this there was the undoubted fact that in its old position it was too far removed from the centre of population,

and was practically inaccessible to large numbers of people to whom the collections would undoubtedly form a source of attraction were they displayed in a more central spot.

The trustees of the Public Library and Museums decided, after careful consideration of the matter, that it would be advisable to remove the collections to the buildings occupied by the Library and National Gallery, where it was possible by additions at the present time to secure halls suitable for the display of the collections, and by means of future additions to enlarge the Museum. So far back as 1856 the Government had purchased what is now the Russell-street frontage of the Public Library block for the purpose of erecting thereon a Natural History Museum, and it is a curious coincidence that after the lapse of 44 years the Museum is to find its home on this very spot, which has remained vacant since that time.

This frontage measures 255 feet in length by 55 feet in width, and the funds now available are being used in building the central block, measuring 110 feet in length. The block in reality forms an extension out to Russell-street of the central part of the galleries already erected; this central part, consisting of a large hall, 110 feet x 155 feet, is now available for the display of part of the collection.

When the Russell-street frontage is complete it will be in part three and in part four stories high. On the basement, partly below the level of the street, will be extensive work-rooms for taxidermists, articulators, carpenters, &c., as well as store rooms. The first floor will consist of a main entrance hall, 110 feet x 55 feet, and on the south side of this will be store and work-rooms connected with the vertebrate collection, and on the north side rooms connected with the geological collection. The second floor will contain a central hall 110 feet x 55 feet, and on the south side rooms connected with the invertebrate collection, and on the north a lecture room and rooms connected with the mineralogical collection.

On the third floor there will be rooms for macerating and the carrying on of work likely to produce unpleasant odours, while a lift will place all the floors in easy communication with one another.

It will be seen that, so far as rooms are concerned, the plan is to have on the basement and top floor the workshops, in the centre of the building the main exhibition halls, and on either side the rooms for the staff and for the housing of the reserve collections.

So far as the collections are concerned, the first object in view is to have these divided into two parts—(1) a series of objects on public view, and (2) a series forming what has been spoken of as the reserve collection, which will be available to students in various branches. For example—in the public collection there

will be, amongst the birds, an illustrative series, the object of which, without the exhibition of a bewildering number, will be that of illustrating the principal forms, and, so far as possible, the conditions under which they live, make their nests, and rear their young; while the reserve collection will contain as large a series of unmounted skins as possible, such as will be useful to students. Or, again, in the minerals and rocks, there will be a series illustrating the more important and typical forms, but in addition to this there will be an extensive reserve collection for the purposes of study. This plan of public and reserve collections will be carried out in regard to each group of objects.

The entrance hall will, at present, be devoted to the exhibition of the invertebrate objects, and to that of certain special cases illustrating mimicry, &c.; the floor of the main hall, into which the former leads, will contain the general vertebrate collection, which is now in course of arrangement, while the large gallery running all round this will be utilized for the display of the geological and mineralogical exhibits.

In the old Museum the arrangement adopted was a geographical one—that is, a certain amount of space was allotted to each of the continents, or to the larger divisions of these, and in this space it was attempted to exhibit the animals inhabiting the region. In regard to Australia it will be remembered that there were cases representing the fauna of Tasmania, Victoria, New South Wales, &c., while other cases contained European, North American, Indian, African animals, &c. In the new Museum the animals are being arranged, in the main, zoologically—that is, for example, fishes will be classified and arranged together, all the reptiles, birds, and mammals will be similarly arranged, irrespective of where they come from, and so on through the whole series. Amongst the mammals the system of grouping is being adopted to a considerable extent. The distribution of the animals will be indicated by coloured maps, and by means of descriptive labels attention will be drawn to the important points connected both with special animals and groups.

While typical examples of our Australasian fauna will find their places in the zoological series, the large hall on the second floor of the new block will be devoted exclusively to an Australasian collection, and it is to the extension and completion of this that special attention will be paid. Before long it is hoped that large groups of some of our more characteristic Australian animals, such as Kangaroos, Platypus, Lyre-birds, Black Swans, &c., showing them in their natural surroundings, will be ready for exhibition. In the extension of this local collection, which it is intended to make the leading feature of the zoological part of the Museum, the co-operation of members of the Field Naturalists' Club will be most welcome and valuable.

BALDWIN SPENCER.

Field Naturalists' Club of Victoria.

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* OBJECTS. *

THIS CLUB was founded in 1880 for the purpose of affording observers and lovers of Natural History regular and frequent opportunities for discussing those special subjects in which they are mutually interested; for the exhibition of Specimens; and for promoting Observations in the Field by means of Excursions to various collecting grounds around the Metropolis.

SPECIAL NOTICE.

Members are reminded that subscriptions for the current year (1900-1) became due on the 1st May, and should be paid to the Hon. Treasurer, or, to the Hon. Secretary, 80 Swanston Street, Melbourne.

THE VICTORIAN NATURALIST

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of Victoria.*

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JUNE, 1900.

The Victorian Naturalist

THE JOURNAL AND MAGAZINE

— OF —

The Field Naturalists' Club of Victoria.

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The Author of each article is responsible for the facts and opinions recorded.

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Field Naturalists' Club of Victoria.

ROOMS—ROYAL SOCIETY'S HALL, VICTORIA ST., MELBOURNE.

BUSINESS PAPER FOR MONTHLY MEETING.

Monday, 11th June, 1900, at Eight p.m.

1. Correspondence and Reports.

2. Election of Members.

Mr. C. J. Gabriel

Proposer.

J. Gabriel

Seconder.

G. A. Kearland

3. Nominations for Membership.

Members making nominations will oblige by handing the full name and address to Hon. Secretary.

4. General Business.

Consideration of Annual Report and Financial Statement for 1899-1900.

Election of Office-Bearers for 1900-1.

The following nominations have been made :—

PRESIDENT—Mr. J. Shephard

VICE-PRESIDENTS—Messrs. T. S. Hall, MA., and J. G. Luehmann, F.L.S.

HON. TREASURER—Mr. J. F. Haase

HON. LIBRARIAN—Mr. O. A. Sayce

HON. SECRETARY—Mr. G. Coghill

HON. ASSISTANT SEC.—Mr. D. Newport

COMMITTEE—Messrs. J. Gabriel, J. H. Gatliff, R. Hall, G. A. Kearland, J. A. Kershaw, F.E.S., D. Le Souëf, C.M.Z.S., A. Mattingley, H. T. Tisdall, and W. Stickland (five to be elected).

5. Reading of Papers and Discussions thereon.

(Authors are requested to hand in a brief resume of their papers to the Secretary.)

1. By Mr. J. H. Gatliff, "Notes on some Victorian Marine Mollusca."
2. By Mr. R. Hall, "Notes on the Great Skua Gull."

6. Reading of Natural History Notes.

Members who may note any unusual occurrence, or see anything of interest in Foreign or Colonial papers, are requested to inform the Secretary of the same that he may arrange for their bringing them before the meeting; such notes should however, be brief.

7. Exhibition of Specimens and Conversazione.

Members exhibiting specimens are requested to furnish the Hon. Secretary with written particulars of their Exhibits for record in Minutes and *Naturalist*.

* EXCURSION. *

SATURDAY, 16th JUNE.—Herbarium. Under the leadership of Mr. J. G. Luehmann, F.L.S. Meet there at 2.30 p.m. Botany.

PROGRAMME 1900-1901.

The Committee will be pleased to receive suggestions of Localities for Excursions for this year as early as possible.

FIELD NATURALISTS' CLUB OF VICTORIA.

THE ordinary monthly meeting was held at the Royal Society's Hall on Monday evening, 14th May, 1900. Mr. T. S. Hall, M.A., one of the vice-presidents, occupied the chair, and about 45 members and visitors were present.

REPORTS.

Mr. F. G. A. Barnard reported that a large party of members had visited the new National Museum on Saturday, 21st April, when Professor Spencer, the hon. director, gave an outline of the plan of arrangement, and, aided by Mr. J. A. Kershaw, the curator, pointed out some of the more noteworthy specimens.

GENERAL BUSINESS.

In asking for nominations for office-bearers for 1900-1, the chairman stated that, owing to ill-health and intended absence from the colony, the treasurer, Mr. J. T. Gillespie, would be unable to offer himself for the position again, and on the motion of Messrs. F. G. A. Barnard and C. French, F.L.S., the hon. secretary was directed to convey to Mr. Gillespie the thanks of the Club for his past services, and to express the hope that he would soon be restored to health.

Nominations for office-bearers for 1900-1 were then made, and Messrs. J. H. Gatliff and J. F. Haase were elected to audit the accounts for the year 1899-1900.

PAPERS READ.

1. By Mr. J. H. Maiden, F.L.S., communicated by Mr. F. G. A. Barnard, entitled "Some Notes of a Trip to the Victorian Alps."

The author referred in an interesting manner to the principal plants, &c., met with in the vicinity of Bright and on the road to Mt. Hotham, and recorded *Eucalyptus dives*, Schauer, as new for Victoria, and in conclusion advised every Victorian botanist to visit the Alps.

Mr. C. French, F.L.S., endorsed the author's remarks as to the trouble caused by the spread of the plant *Hypericum perforatum*, St. John's Wort, which had completely taken possession of large tracts of country.

On the motion of Mr. A. J. Campbell and Mr. C. French, F.L.S., a vote of thanks was passed to Mr. Maiden for his paper,

2. By Mr. R. Hall, entitled "Field Notes on (a) *Hirundo neoxena*, Gould, and (b) *Pachycephala gutturalis*, Lath."

The author recorded some interesting observations on the nesting of the House-Swallow, *Hirundo neoxena*, and the White-throated Thickhead, *Pachycephala gutturalis*.

His remarks gave rise to some discussion, in which Messrs. Kearland, Le Souëf, Coles, Campbell, French, and others took part.

NATURAL HISTORY NOTES.

Mr. A. J. Campbell drew attention to Mr. R. Hall's paper on "The Birds of Kerguelen Island," portion of which had recently been published in the *Ibis*, and regretted that the Club had been unable to publish it in the *Naturalist*.

Mr. A. Mattingley stated that on 7th November last, after a thunderstorm, he had captured a silver eel on a precipitous cliff of the Lerderderg Ranges, about sixty yards from the river, and raised the question as to how it came to be in such a place, but no satisfactory answer was elicited.

Mr. T. S. Hall, M.A., drew attention to his exhibit of the type specimens of Victorian fossil calcareous sponges recently described by Dr. G. J. Hinde, F.R.S.

Mr. F. J. Ellemor drew attention to an abnormal-plumaged female Australian Pipit, *Anthus australis*, obtained by him at Bulla. The bill and legs were pale yellow; crown of head lemon-white splashed with fawn; ear-coverts fawn; cheeks lemon-white; throat and primaries white; tail white, two centre feathers edged with fawn, darker at the tips; secondaries white edged with fawn; breast fawn; abdomen and under tail coverts creamy white; upper tail and wing coverts fawn to brown; rest of plumage white blotched with fawn, and eyes black.

EXHIBITS.

By Mr. A. Coles.—Skins of *Paradisea raggiana*, male and female; *P. rudolphi*, *Lophorhina superba*, *Diphyllodes speciosa*, *Cicinurus regius*, *Parotia sexpennis*, and *Craspedophora magnifica*. By Mr. F. J. Ellemor.—An abnormal-plumaged Australian Pipit, from Bulla. By Mr. C. French, F.L.S.—Moths, *Satraparchis macrosoma*, Lower, new to science, taken by Mr. Brittlebank at Myrniong, Victoria, and *Plegetonia irioides*, Lower, from N.W. Australia; also, *Erebus agrippinus*, the largest moth known, from Brazil. By Mr. C. French, jun.—Specimen of bird and eggs of Black-naped Tern, from North Queensland, and the orchids *Pterostylis pedaloglossa* and *P. parviflora*, from Cheltenham, found flowering 6th May, 1900. By Messrs. J. H. Gatliff and C. J. Gabriel.—Marine shells dredged in Western Port Bay, off Rhyll, Phillip Island. By Mr. T. S. Hall, M.A.—Types of fossil calcareous sponges, from Victoria, lately described

by Dr. G. J. Hinde, F.R.S. By Mr. G. A. Keartland.—Rare Australian birds' eggs, viz., two examples of Flinders Cuckoo, *Eudynamis flindersii*, found in the nests of Allied Oriole and Sordid Friar-bird, from North Queensland; type egg of Yellow-backed Honey-eater, *Melithreptus lætior*, from North-west Australia; two examples of Yellow Honey-eater, *Ptilotis flava*, from North Queensland; type egg of Black-throated Coachwhip-bird, *Psophodes nigrogularis*; Black Honey-eater, *Myzomela nigra*; Banded Honey-eater, *M. pectoralis*; Magnificent Rifle-bird, *Craspedophora magnifica*; type egg of *Chlamydodera guttata*; *C. nuchalis*; *C. orientalis*; and *C. maculata*. By Mr. G. E. Shepherd.—Rare birds' eggs from New South Wales: Nankeen Heron, Grey Struthidea, Black-cheeked Falcon, and Regent-bird. By Mr. F. P. Spry.—Tertiary fossils from sewer excavations, corner Barkly and High-streets, St. Kilda; recent shell and driftwood from sewerage excavation, Power-street, near Kavanagh-street, South Melbourne.

After the usual conversazione the meeting terminated.

SOME ORNITHOLOGICAL NOTES.

BY ROBERT HALL.

(Read before the Field Naturalists' Club of Victoria, 12th February, 1900.)

DURING the last few months some ornithological facts have come under my notice which seem worth placing on record. Though they relate principally to the genus *Pardalotus*, they can be more conveniently referred to under separate headings:—1. *Pardalotus affinis*, Gould, synonymous with *P. assimilis*, Ramsay. 2. Field Notes on a Phase of *Pardalotus assimilis*, Ramsay. 3. A Tree-building Pardalote as Foster-Parent to a Cuckoo. 4. Additional Information on the Plumage of *Malurus cyaneus*, Ellis.

1. PARDALOTUS AFFINIS, GOULD, SYNONYMOUS WITH *P. ASSIMILIS*, RAMSAY.

In the British Museum Catalogue the keys to the species read as follows:—

“*P. assimilis*, Ramsay (sub-sp. of *P. ornatus*, Temm.)—Head streaked with white; third and fourth primaries edged with white; tips of primary coverts scarlet, crimson, orange, or yellow.

“*P. affinis*, Gould.—Head streaked with white; third primary only edged with white; tips of primary coverts always yellow.”

The key to *P. assimilis* is modified not only by the original described by Dr. Ramsay, but by Dr. Sharpe, of the British Museum. Dr. Ramsay in his “Tabular List of all the Australian Birds at Present Known” (P.L.S. N.S.W., ii., 1877, p. 180), also published separately, 1888, p. 4, writes in a footnote—“Tips of

spurious wings always orange-red, never yellow as in *P. affinis*." In vol. x. Brit. Mus. Cat. Birds, p. 56, 1885, Dr. Sharpe speaks of it thus:—"I find, moreover, that all the birds for which I propose to adopt Ramsay's name of *P. assimilis* have, as a rule, the third and fourth primaries edged with white, the third for two-thirds of its length, the fourth only near the base, but varying in extent and sometimes extending a good way up the feather." What the "as a rule" refers to I do not know unless it means the third primary alone is edged with white. Recently in the Proc. Lin. Soc. N.S.W., 1899, page 472, I described a phase of *P. assimilis* in which the third primary alone in all its stages of age was edged with white and the speculæ crimson. I am now able to describe two additional phases, and more clearly define a third (d" as under) as follows:—

- d' The third primary alone edged with white for two-thirds its length; the speculæ orange.
- d" The third primary edged with white for two-thirds its length, and the fourth with a smaller amount of white, except at its base, which is not white; speculæ dull yellow.
- d''' The outer edge of the third primary alone edged with white for two-thirds its length; speculæ bright yellow.

A comparison of phase d''' with *P. affinis* will show them to be the same, and a whole description of either will apply to both. The data of the specimens are:—d' adult male skin, 1899, Brighton, Vic.; d" adult female skin, 21/10/94, Box Hill, Vic.; d''' adult male skin, 19/8/97, Box Hill, Vic. From this I conclude the species *P. affinis*, Gould, is the same as the sub-species *P. assimilis*, Ramsay, and accordingly will rank as a synonym of it, the key to the sub-species now reading:—Head streaked white; third primary edged for two-thirds its length with white, sometimes the fourth, and varying in extent; tips of primary coverts scarlet, crimson, orange, or yellow.

Furthermore, I have recently received skins of *P. ornatus*, Temm., which show the speculæ to be in (a) yellow, (b) nondescript red, (c) scarlet. It is for this reason I feel disposed to unite the species *P. affinis* to the sub-species *P. assimilis*. If Dr. Ramsay in the first place was satisfied to consider what he called *P. assimilis* a sub-species, I am of opinion, now that the colours of *P. ornatus* are multiplying in about the same proportion as those of the sub-species, that the same relation may remain with regard to *P. affinis*.

2. FIELD NOTES ON A PHASE OF *PARDALOTUS ASSIMILIS*, RAMSAY.

A few weeks ago I reported the finding of an undescribed phase of *Pardalotus assimilis*, Ramsay, in Victoria. So far, the normal

stage of this sub-species had not been recorded as found in this colony, but I am now able to do so, Mr. Lehmert, of H.M. Customs, having secured a specimen at Tooradin on the 1st of August last, which he has handed to me. In a few words I will express what I saw of the habits of this trichlorotic bird. It is nomadic, arriving along the latitudes of Port Phillip in August—*e.g.*, 4/8/94, 14/8/97 (an early spring), Box Hill; 4/8/98, Somerville, per Mr. Geo. Shepherd; and on the confines of the Heytesbury Forest, further south, in September—13/9/96, 13/9/97, per Mr. Geo. Graham. From the Heytesbury its departure was noted 1/2/97.

The bird does not stay to winter in its breeding haunt, and is away long before sure signs of the coming fall are generally noticeable. Quickly bounding in its flight, it shows the usual methods of the "Diamond Birds." Rushing from bough to bough and eucalypt to eucalypt in search of insects, it leads an active life. The same vigour is shown on leaving its lowly-placed nest, for it flies rapidly up into a tree to view the position, hunt the trail of an insect, and more easily glide or flutter down to its previously occupied position, perhaps *en route* spending a moment on a bough close by. In the search for provender this useful insectivorous bird follows the course of a bough in search of "scales," picking up strays and permanents alike. I have watched this phase of the sub-species and the species acting similarly in travelling along the stems of saplings, taking off the coverings and feeding upon the insects within. I have found the remains of coleoptera and diptera within the stomachs, but these are not their only food in the wide range of insect life. On a clear summer's day I have tried to quickly locate the birds in the high parts of tall timber, but with slim-bodied animals, 4 inches long, it is not easy. Assisted by their calls and a field-glass you will find them. For a time the little ventriloquists may lead your eyes in all directions, and finally close above you will be seen the objects of your search.

Mr. Gould writes of *P. ornatus* having two notes in its call. This phase has three, phonetically "pick-it-up" or "wit-e-chu." Occasionally, I believe, there is a hard-sounding trill, the identity of which I am not sure.

Both sexes take part in planning the nest and in the excavation work. While one is labouring at the bowl the other is expelling the material with its feet, little by little, until finally it is forced out beyond the entrance to the ground below. By quietly approaching the tunnel mouth I saw the process in certain of its interesting stages.

The male either takes part in incubation, or, which is more unlikely, does all the "sitting," because when I cut away, at a later date (4th November, 1893, 4 p.m.), the whole tunnel, I found it

alone upon the eggs. This is the specimen marked (c), and is upon the table. Within 2 feet of the nest entrance was a second cave. It was merely 3 inches in the hard soil, and sufficient only to shelter the non-sitting bird during the night.

The nest-building of the sub-species appears to differ from that of *P. ornatus* in so far as feathers are not used as a lining to the nest. Further observations will probably show there is no regular difference. The nest is cup-shaped, with an irregular and loosely constructed outer lip, for there are two. Dried grasses are used externally, and bark internally in part, specially upon the floor. The whole appears in two parts, the inner being a neat and cup-like body placed down in a loose but regular spherical wall of dried grasses, interwoven and towering concavely above the lip of the inner wall by an inch on one side and 1.5 inches on the opposite one. Height of nest on one side 3 inches, and 4 inches upon the opposing wall. Diameters :—Structure, 4.25 inches x 3.75 inches; bowl, 2.25 inches; depth of bowl, 1.25 inches. The nest is made to fit in a cavity with domed ceiling and excavated in the hard subsoil at the end of a tunnel. This tunnel is ten inches long, and is drilled with a slight upward tendency, as is usual with most ground-boring birds. The nest entrance is 2 feet below the surface of the ground, and in a creek bank some 9 feet above the bed of a trickling stream, though with the stream not immediately below the entrance. By this arrangement the young birds are fearlessly able to essay their first flight. Judging by the remains of old vegetable matter at the base of the nest, the hollow has been used in a previous year for the purpose of nesting.

(To be continued.)

A LEPIDOPTERIST AT GISBORNE AND MACEDON.

By J. F. HAASE.

(Read before the Field Naturalists' Club of Victoria, 12th March, 1900.)

At the kind invitation of Mr. and Mrs. Geo. Lyell, I spent a very pleasant time with them at Gisborne during the New Year holidays, though the weather was rather too warm for much walking or collecting.

On the afternoon of 31st December a short trip was made towards Mt. Gisborne in quest of one of our smallest butterflies, *Lycæna serpentata*, Mr. Lyell having taken some specimens there twelve months previously. *En route* a paddock of small stunted wattle trees, *Acacia decurrens*, engaged our attention, and as large numbers of small black ants were noticed, a diligent search was made for the larvæ of the genus *Ialmenus*, which are always attended by ants, and we were soon rewarded by finding the caterpillars of a "Blue" new to either of us.



Negative by R. HALL.

Half-tone by TRIUMPH ENGRAVING CO.

NEST OF PARDALOTUS ASSIMILIS, RAMSAY.

Example of a nest built at the dark end of a tunnel.



A butterfly that was taken for *Ialmenus evagorus* was noticed, which, however, upon being netted, proved to be *I. inous*, the rarest of the Victorian *Ialmenus*. We therefore concluded that the larvæ seen were those of *I. inous* and secured a series. Since returning home our supposition has turned out to be correct, several having been successfully bred. Numbers of the handsome *Xenica achanta* were noticed in their favourite haunts. A few perfect specimens were secured for the cabinet.

From a Blackwood tree, *Acacia melanoxylon*, several larvæ of *I. myrsilus* were taken. At Upper Ferntree Gully I have noticed numbers feeding on the Silver Wattles, *Acacia dealbata*, but have not been able to find the chrysalides. Mr. Lyell has taken the larvæ and found the chrysalides under the bark at the foot of the Blackwood. In all the other members of the Victorian *Ialmenus* the chrysalides are found on the twig or leaf, surrounded very often by the larvæ, but in *I. myrsilus* the caterpillar wanders for a suitable place to complete its metamorphosis. Perhaps as it remains in the pupa a considerable time—from seven to nine months, with rare exceptions—it wisely seeks shelter from wind and rain, which the others do not need, they passing through the pupa stage in from seven to fifteen days.

New Year's Day turned out very hot, rendering collecting very uncomfortable. Several trees with fine bunches of Mistletoe were searched for chrysalides of *Ogyris olane*, and a few were taken, but many empty ones seen, clearly indicating that we were a little too late. The Native Cherry, *Exocarpus cupressiformis*, one of the food plants of *Delias aganippe*, the Wood White, was examined for the larvæ, but without success. This butterfly, so plentiful around Melbourne a few years ago, is now becoming scarce and difficult to find. *Ialmenus evagoras* was met with in large numbers. So great was the quantity of caterpillars that some of the wattles were stripped of leaves. Large series were taken to breed in hopes of obtaining varieties, such as Mr. F. P. Spry was successful in breeding, with the markings on the under side of wings very pale, and almost similar to *I. inous*.

Next day, 2nd January, having secured the services of a friend to drive us to Mt. Macedon, we made an early start, our destination being the Camel's Hump. The country towards the mount was very green for the time of the year, the grazing paddocks particularly having an abundance of grass. On one of the lower slopes of the range a suitable spot was chosen to commence the day's collecting. Some splendid bunches of Mistletoe, *Loranthus pendulus*, were examined in hopes of obtaining larvæ of *Ogyris abrota* or *Delias harpalyce*, the Imperial White, but with no result; however, we were successful in obtaining several chrysalides and caterpillars of *O. olane*.

Along the banks of a small creek a few of the Dark Coppers,

Chrysophanus aurifer, were netted flying over some bushes in bloom. Several blackberry bushes were in flower, and as they are favourite resorts for the "Skippers," a diligent look-out was kept, but without result. Large numbers of the familiar "Browns" were seen revelling in the hot sunshine, making an interesting scene to an entomologist. A very profitable time could have been spent here, but our destination being a good two hours' climb, we were reluctantly compelled to leave.

Along the lower slopes leading to the Hump sad evidences of the great bush fire were seen. Mr. Lyell had hopes of obtaining some specimens of the rare Skipper *Trapezites idothea*, but unfortunately the fire had swept through the patch where they had been taken in previous years.

Upon reaching the summit of the Hump, about 3,300 feet above sea level, a fine view of the surrounding country was obtained. Here several *T. iacchus* were seen, but were exceedingly difficult to capture, and it was only after continual perseverance that we succeeded in obtaining specimens. Their favourite haunts were upon the bare rocks, rendering it very difficult to approach them. However, six were netted after a lot of work. One specimen of *Hesperilla tasmanicus* was taken here in fair condition. A few *Chrysophanus aurifer* were again met with, but were very wild and flighty, and only one was secured. The ubiquitous little blue *Lycæna labradus* were in strong force, while beautiful specimens of *Pyrameis kershawii*, *Xenica klugii*, and *Heteronympha merope* were in abundance. Micro-lepidoptera were conspicuous by their absence.

Returning down the mount we rejoined our friend, who kindly drove us back to Gisborne.

In conclusion, I can fully endorse the closing sentences of the report of the Gisborne excursion in the February *Naturalist*, that a trip to Gisborne to see Mr. Lyell's collection would repay anyone; and I have to thank Mr. and Mrs. Lyell for their many acts of kindness by which my trip was made so enjoyable.

A TRIP TO ANGLESEA RIVER.

By H. T. TISDALL.

(Read before the Field Naturalists' Club of Victoria, 10th April, 1900.)

ANGLESEA River is the estuary formed at the mouth of Swampy Creek as it enters the sea, about midway between Barwon Heads and Lorne. The best way to reach it is by taking the steamer to Geelong, thence by coach for a distance of 22 miles, passing Torquay on the road. From Torquay to Anglesea the road climbs up and along the top of a ridge of high land running parallel with the shore of Bass Straits. The first three miles is over grassy downs, from which beautiful glimpses of the sea may

be obtained. Gradually the road passes into more timbered country. Small eucalypti of various species, interspersed with Wattles, Tea-trees, Banksias, &c., abound, the undergrowth being composed of ferns, tussocky grass, heath-like shrubs, and a small variety of *Xanthorrhœa australis*, the larger Grass-tree. These must be very beautiful during their flowering season, but in January nothing was to be seen of them except the short brown trunks crowned by the hard, long, narrow grass-like leaves, the tall flowering-spikes being represented by what seem to be dead upright poles. These poles are in such profusion that they impart quite a weird aspect to the scenery.

In spring and early summer the Grass-trees would present a very different appearance, when the dark stumps, surmounted by the graceful bending leaves, each with its spike of creamy-white starlike flowers, often three or four feet in height, must make an exquisite scene.

As the road nears Anglesea it dips down several hundred feet through well-timbered country. We found the Anglesea River to be a pretty sheet of water, from fifty to sixty yards broad, but barely two miles long. Rowing up the river we soon came to a full stop where the estuary commences in a number of small freshwater streams. The ground between the streams is very soft, being composed of a rich dark soil, thoroughly soaked with moisture, but the growth of the plants in this soil is perfectly marvellous. I measured specimens of the common Coral Fern, *Gleichenia circinata*, nearly twenty feet high. The principal shrubs were Cassinia and other species of Compositæ, the Hazel, *Pomaderris apetala*, with *Pultenaea daphnoides*. The greater mass of Tea-tree was *Leptospermum scoparium*, which was in full bloom. Anything like the mosquitos I had never seen; they were simply in clouds, and of the largest size—in fact, we had finally to decamp from the land into the boat. I was surprised to find bushes of that prickly Proteacean, *Persoonia juniperina*, so near the coast, as I had hitherto thought that it was confined to the Gippsland hills. Huge clumps of reeds, *Lepidosperma gladiatum*, are to be seen on both sides of the river. I am sure the entomologist would be well satisfied with this district, for insect life abounds, the Tea-tree bushes and other scrub forming good cover for them.

Two species of our Australian Dodder parasites were very common, the small species, *Cassytha glabella*, twining itself round grasses and reeds, while the large species, *Cassytha melantha*, could be seen on most of the smaller eucalypts. As this species is so large the suckers with which it robs its victim can be plainly discerned. The open spaces on the bank of the river were covered with masses of beautiful white flowers; these proved to be a rather uncommon Rutacean, *Boronia parviflora*.

The row down the river is very pretty, both banks being completely covered with the original vegetation, no sign of man's work to be seen until you arrive at the bridge which connects the road to Airey's Inlet, further south. Here the country opens out, and the range to the right rises upwards, disclosing quite a number of houses scattered over the hillside.

Nearing the coast the inlet becomes very shallow, and a sharp lookout has to be kept for treacherous mudbanks, and finally the sand completely shoals up the entrance. During January last there was fully three hundred yards of sand between the river and the sea. The sea coast towards the north-east is different from anything I have observed before. For upwards of four miles from the river to Point Addis there are huge frowning cliffs the whole way. The day I went round I timed it so that the tide was full out, consequently I had a beautiful hard sandy beach, just perfect for the wheelman. There are no rocks, except at two points a couple of miles apart, but the land rises up almost perpendicularly from 100 to 200 feet. I was so struck with the peculiar appearance of the cliff that I examined it carefully. The base for a few feet seems to be sandstone, over this a belt from 30 to 100 feet thick of a kind of dark mudstone, which was so friable that I crushed it in my hands into impalpable powder. Mr. T. S. Hall informs me that this rock contains a number of small fossils, but I did not find any. If any of our geological members visit the district they would have a good chance of getting something, by tin-dish washing, that would serve to elucidate the age of this stratum. The vertical face of the cliff is evidently due to its soft structure, for a crack formed on the surface near the edge during dry weather would allow the subsequent rain to percolate downwards, thus widening the crack, and in the meantime the sea, in bad weather, would wash away a few feet at the base, and so a complete slice would fall down. That this is the case may be seen all along the coast by the remains of recent falls. At one of these I was enabled to see that the stratum above the dark mud rock was, like the base, formed of sandstone. Point Addis itself ends in a jumble of immense rocks, so rugged and slippery that I could not pass.

South-westerly from Anglesea the coast is very different; it rises gently from the river to a height of about 400 feet; the surface, scrubby at the base, becomes more heathy as it ascends. Here I found a great quantity of plants of a species hitherto unrecorded in Victoria except for the north-west, the Mallee country. It is one of the Rhamnaceæ, *Cryptandra vexillifera*, a low and very pretty shrub. The slopes were very gay with a coarse tufty grass, mixed with bright lilies, and several species of Compositæ. The Fringed Lily, *Thysanotus tuberosus*, was very evident, also a great number of everlastings. The base of this

hill towards the sea is in many places very abrupt ; this formation was evidently occasioned by the encroaching waters. Between the river and Point Roadknight there are only three places where the hill slopes into the sea, each ending in a mass of rocks. Thus the shore line forms four small bays, each enclosed by rocky points.

A gentleman, evidently a geologist, whom I accidentally encountered, informed me that the second point, called the Flat Rocks, contained many interesting specimens. Just above these rocks I found another rather uncommon plant, one of the Sterculiaceæ, *Thomasia petalocalyx*. A curious phenomenon may be seen here ; the whole side of the hill above these rocks, containing about 40 acres, has slipped down for several feet. I did not go up to measure the exact depression, but judging from the perpendicular wall exposed near the top of the hill, where the mass broke off, I should imagine it has fallen about 12 feet.

A rather amusing incident occurred at these rocks. Our party had decided on a picnic to Point Roadknight, and I strolled on before, being botanically inclined. I was so interested that I took no note of the time. Looking at my watch I found it was 12 noon, and I turned back to look for the rest of the party. At length I arrived at the Flat Rocks, and there I discovered them perched on some isolated rocks. Between us was a mass of foaming water, for the tide had risen, and we were completely separated. I tried vainly to reach them by scrambling up the hill, intending to slide down the loose bank, but my courage failed me—I might get a sprained ankle or a broken leg, so I returned to the rock. Through the noise of the surf we could occasionally exchange ideas, but, alas ! not even a biscuit could I get, whilst I had the pleasure of sitting there for two hours and a half watching them reading novels and munching biscuits.

Point Roadknight presents many interesting features to the naturalist. It is composed of a narrow ridge of rocks and sand protruding into the sea a distance of six or seven hundred yards. The first part is a loose sand hummock covered with Banksias and Tea-trees, and kept together by immense tufts of two species of Cyperaceæ, *Lepidosperma gladiatum* and *Chorizandra enodis*. Further on the rock becomes more and more evident, until at length there are only perpendicular rocks, weathered into the most fantastic forms, such as tiny castles, arches, or pointed spires, one very curious form representing a statue of a dog sitting on his hind legs. Just round the Point Mr. A. H. S. Lucas and I had a splendid morning, seaweed gathering. Amongst the seaweeds floating around us we secured many specimens of, to me, a very uncommon species, *Belletia eriophorum*, of which I had previously only found one poor specimen at Ocean Grove some years ago.

For a seaweed collector these rocks form a perfect paradise. All one has to do is to stand on the rock as the tide comes in, and as it creeps upward thousands of specimens float past, fully spread out so as to show all their beautiful shapes, and the collector takes what he requires. When the tide is out the beach forms a lovely road for the cyclist, the four miles being easily covered in twenty minutes. But I ought to warn the intending cyclist that the last few miles of the road to Anglesea is the worst that, at any rate, I have ever travelled. It is composed of very loose sand, into which the tyre sinks. I am speaking more particularly of the road *via* Jan Juc, which I was assured was much shorter than that by Torquay. It may be, but oh! I shall never forget the four hours we spent getting over about eight miles of road between Jan Juc and Anglesea.

On one flat near the river I found hundreds of plants of the orchid *Dipodium punctatum*, so I determined to try and solve the problem of how they obtain their nourishment, but was completely baffled. The ground in which they flourished was so hard that, even with the help of a good-natured resident armed with a pick, we could not find the roots of the gum trees on which they are said to be parasitic. Every plant has a number—in one I counted fourteen—of long tubers, or rather rhizomes. These tubers were of various sizes, from three to ten inches long, the diameter being about half an inch; they were perfectly smooth, and even with a good lens I could not detect any kind of root. The problem stands thus—the plant has no leaves, only rudimentary brown scales; the stem is not green but red, and apparently there were no roots or suckers attached to another plant. Of course the tubers might take in a certain amount of cell-sap from the soil, also the red colour of the stem might mask chlorophyll, but the surface in both cases is limited, and the plants were very luxuriant.

Bentham, in the "Flora Australiensis," says nothing about its mode of obtaining nourishment; but Baron von Mueller, in the "Key to Victorian Plants," says that they live as parasites on roots. Now, I think it would be interesting if some of our members would endeavour to settle the difficulty by examining any plants they come across. The particular roots on which they live might be ascertained.

One day I took a trip over to Airy's Inlet, a distance of eight miles by the forest road, and as I returned by the coast range I was able to gain a fair knowledge of the plants of the district. I only obtained one rather rare flower, and its rarity only consists in its flowering on the 1st January, namely, the orchid *Orthoceras strictum*. Nearly everywhere were plants of *Isopogon ceratophyllus*, which I had never seen so plentiful before; the two *Hibbertias* were also common, *H. stricta* and *H. fasciculata*; *Pimelea*

octophylla was in blossom, but *P. phyllicoides* had passed into fruit. *Stackhousia linearifolia*, *Tricoryne elatior*, *Cesia vittata*, *Comesperma ericinum*, *Erythrea spicata* were all over the downs, while *Gompholobium huegelii*, *Patersonia glauca*, and *Prostanthera denticulata* could be seen in shady places. The view along the coast range coming back was really beautiful. On one side glimpses of the ocean could be seen stretching between Barwon Heads past the Airy's Inlet (Split Point) lighthouse to just beyond Lorne. To the North was the whole basin of Swampy Creek, with the hills forming part of the Otway Forest as a background.

My curiosity was aroused by the account of a singular plant which was said to grow on some of the rocky portions of Point Roadknight, up which very few had attempted to scramble, so I took a special trip to find it, and after some time succeeded. I had not seen it before, and was rather uplifted, but my friend Mr. C. Walter assures me it is fairly common near Brighton, the plant being *Alyxia buxifolia*. While there I secured some plants of *Calocephalus brownii*, which forms great cushion-like masses all over the Point. This turns out to be rather uncommon, as it is often overlooked, being very much like other species of *Calocephalus* in habit.

In conclusion, I might remark that Anglesea River seems to me an exceptionally good place for a field naturalist. It is only a seven hours' journey from Melbourne, and as the steamer and coach fare is only twelve shillings and sixpence for the return journey of 140 miles the expense is not heavy.

A BEHEADED VALLEY.

By T. S. HALL.

(Read before the Field Naturalists' Club of Victoria, 10th April, 1900.)

VALLEYS may be divided, from the point of view of their origin, into two groups, those which have not been formed by the agency of running water and those which have. The first group includes such valleys as are formed between the advancing ridges of sand dunes. These may be of considerable length, and readers of Carnegie's "Spinifex and Sand" will remember his struggles in their labyrinths in Central Australia. Again, valleys may be formed between volcanic cones or between sheets of lava. Other members of the same great group may owe their origin to earth-folding or to faulting. Thus parallel faults, extending for great distances, may have let down the intervening country, and so have produced a great valley. However, the most usual method of valley formation is by the action of running water. Given time and a stream will cut through anything. In streams with a rapid fall the greatest amount of cutting is done in the channel

itself, for here sand, gravel, and boulders are scrubbed against the underlying rock and so rasp it away. Consequently, if no other agency were at work, we should find all comparatively rapid streams at the bottom of a precipitous-sided gorge, such as those we read of as being occupied by the Colorado River in the Western United States. But such precipitous valleys are rare, and may be said to be confined to country in which the strata are horizontal and consist of resistant rocks overlying others more easily acted on by the weather. The constancy with which we find the sides of valleys to have a gradual slope instead of a precipitous one compels us to look for a constantly acting cause, and this we find in the group of phenomena generally spoken of as "weathering." The sides of the steep cliffs are broken down and their material thrown into the river bed, to be still further broken up and washed away. The causes which bring about this result are, as has just been stated, manifold, and their causes in turn are diverse. The rock, if it be a hard one, has first to be disintegrated, so that it may be washed down by the ordinary rainfall acting in purely a mechanical way. Rock is broken down by several different agencies, and the question which will be the more rapid in its effects will depend on the structure of the rock and on the chemical composition of its constituents. The action of percolating rain water with the acids produced by the decomposition of organic matter, the expansion and contraction caused by alternations of heat and cold, the force exerted by roots growing down cracks, all have a destructive effect, and render the hillsides more liable to wash down by the rain. From a consideration of these facts we see that, other things being equal, the older a valley is the more gradual should the inclination of its sides be; exposure of bare rock will be absent, and we will find a grassy or even tree-clad slope. But before we apply this criterion of age we must see that the other things are equal, the nature of the rock and the amount of rainfall being the most important.

A clear grasp of the facts contained in these prefatory remarks is necessary for the understanding of a particular case which came recently under my notice.

Visitors to Lorne will remember that as a rule the various creeks flow down valleys which are densely clothed by timber and scrub; the valley floor is covered with a tangled maze of vegetation through which it is difficult to force one's way, and it is mainly just below waterfalls that bare rock is much in evidence. One valley, however, stands out in marked distinction from all those that I have seen, and that is the valley of the Cumberland. Here we find a narrow gorge, hemmed in between cliffs that in places rise precipitously for hundreds of feet. The stream-bed is swept clear of obstructing vegetation and the river for miles

babbles over a rough, bare, boulder-strewn channel. Evidently for some reason the valley is deepening at a more rapid rate than are the neighbouring ones. The explanation of this seems to be fairly simple. The coast, it may be mentioned, is a rough one, and, excepting in sheltered or partly sheltered bays, sandy beaches are absent, and a walk along the coast often entails the expenditure of a considerable amount of energy. To avoid this work footpaths have in some instances been made along the hill-sides far above sea level, and along a path of this nature the track from Lorne to the Sheoak Creek runs. On crossing this creek the Cumberland track leaves the coast, and strikes up a valley which shows some peculiar features. It is wide and flat-bottomed; the hills bounding it are rounded and grass-clad, scrub is almost absent, and the timber sparse. More striking still, however, is the fact that the valley is a dry one. No creek flows down it. There is, it is true, a small gully in the bed, but on walking up the valley it is clear that it is only large enough to carry off the present local drainage from the sides of the valley, and had nothing to do with its formation. For nearly two miles the path runs up this valley, gradually rising as it goes, then suddenly we find the upper end of the valley is cut off by another valley running almost at right angles to it, and about a hundred and fifty feet below it we see the Cumberland River, which enters the sea less than a quarter of a mile below. Evidently the sea has cut back the cliffs till the river was able to run over the lip and find its way to the ocean from this point in a few hundred yards instead of a couple of miles. The river gradient being thus suddenly increased, the stream rapidly cut back up the valley at a rapid rate, and thus the steep cliffs were formed. In the dry valley, the old river course, no more cutting was done, and the slopes were rapidly rounded by the rain.

One other interesting fact is worthy of notice. The mouth of the dry valley is barely raised above the level of the storm beach; in other words, the relative level of sea and land has remained constant since the river flowed down its old course—the land has neither risen nor subsided.

EXCHANGE.—Mr. H. W. Parritt, 8 Whitehall Park, London N., England, is desirous of obtaining Australian Echinoderms and Crustacea, and can offer British and foreign species in exchange.

EXCHANGE.—Mr. E. Brunetti, 352 Strand, London, is desirous of obtaining Australian and New Zealand Diptera, in exchange for named British Lepidoptera and Coleoptera or European Diptera. Specimens should be pinned on long pins, with month of capture and locality given.

BOOK NOTICE.

CATALOGUE OF SCIENTIFIC AND PERIODICAL LITERATURE IN THE MELBOURNE LIBRARIES. By T. S. Hall, M.A., Hon. Librarian Royal Society of Victoria. Melbourne: By Authority—R. S. Brain, Government Printer.

THIS work, as its title indicates, is a catalogue of the scientific periodical literature, reports, &c., in the possession of various libraries in Melbourne, such as those of the Government departments, scientific societies, &c. A mere glance at the Catalogue, which extends to 225 pages, fails to indicate the amount of time and labour which it must have cost the compiler. In the first place, no less than forty-nine libraries have been referred to for works which at any time are difficult to catalogue and keep in order. About 1,330 titles of publications or publishing bodies and societies are quoted, though of course some of these have now ceased to exist or to publish. Many of these have one or more cross references, while numbers of these main headings contain several minor ones, such as the Field Columbian Museum of Chicago, which issues nine different publications, the Linnean Society of London with seven, while a Government like that of the United States requires nine pages for its various publications. The value of the work to the student will be that he can at once ascertain if a required work is in any of the Melbourne libraries and in which. Naturally the Melbourne Public Library is referred to the most frequently, then probably those of the Royal Society, the National Museum and Observatory. Many of the publications are to be found in four or five libraries, while such a publication as *Nature* is to be found, more or less complete, in fourteen, though four of these have now ceased to take it in. The author is to be congratulated on the completeness and careful arrangement of his Catalogue, the publication of which was undertaken by the Trustees of the Public Library, Museums, and National Gallery of Victoria. F. G. A. B.

NUMBERS OF INSECTS.—In the recently issued volume of the "Cambridge Natural History," dealing with Insects (part 2), Dr. D. Sharp gives some estimates of the various kinds of insects known. He says there are about one hundred and fifty thousand species of beetles, fifty thousand species of butterflies and moths, forty thousand species of Diptera (two-winged flies), and perhaps three thousand species of bees, wasps, &c., with many more yet to be described.

THE SOCIETY FOR THE PROTECTION OF BIRDS (London) has issued its ninth annual report, and now counts 22,000 members, with a satisfactory credit balance. The work of the society extends to all parts of the world, and we believe that its influence for good is gaining ground.

Field Naturalists' Club of Victoria.

* OFFICE-BEARERS, 1899-1900. *

President: MR. J. SHEPHARD.

Vice-Presidents: MR. T. S. HALL, M.A. MR. J. G. LUEHMANN, F.L.S.

Hon. Treasurer: MR. J. T. GILLESPIE, Messrs. Alex. Cowan and Sons,
395 Little Flinders Street, Melbourne.

Hon. Librarian: MR. O. A. SAYCE, Harcourt Street, Hawthorn.

Hon. Secretary: MR. GEO. COGHILL, 80 Swanston Street, Melbourne.

Hon. Editor of the "Victorian Naturalist":

MR. F. G. A. BARNARD, Bulleen Road, Kew.

Committee:

MR. J. GABRIEL, MR. G. A. KEARTLAND, MR. J. A. KERSHAW, F.E.S.,
MR. D. Le SOUEF, C.M.Z.S., and MR. H. T. TISDALL.

* OBJECTS. *

THIS CLUB was founded in 1880 for the purpose of affording observers and lovers of Natural History regular and frequent opportunities for discussing those special subjects in which they are mutually interested; for the exhibition of Specimens; and for promoting Observations in the Field by means of Excursions to various collecting grounds around the Metropolis.

SPECIAL NOTICE.

Members are reminded that the Club's year ended on 30th April last, and that subscriptions (15s.) for 1900-1901 are now due, and must be paid on or before 11th June, in order to entitle members to vote at the Annual Election of office-bearers, which takes place on that day. The Hon. Treasurer (Mr. J. T. Gillespie, 395 Little Flinders Street, Melbourne) will be glad to receive such subscriptions.

THE VICTORIAN NATURALIST

*Contains the proceedings of the Field Naturalists' Club
of Victoria.*

Authors of Papers published in the *Victorian Naturalist* are informed that reprints of such articles can be obtained at a nominal cost by giving notice previous to publication to the Hon. Sec., from whom all information can be obtained.

MOST of the Numbers from the commencement, January, 1884, can be obtained from the Hon. Sec., Mr. Geo. Coghill, 80 Swanston Street, Melbourne, at Sixpence each, or in sets (except Vols. I. and IV.), with title page and index, 6/- per volume.

The Hon. Sec. will pay full price for clean copies of Vol. II., No. 3; Vol. IV., Nos. 2, 3, and 4; Vol. V., No. 9; Vol. VIII., No. 10, and Vol. IX., Nos. 2 and 3.

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VOL. XVII.—No. 3.

JULY, 1900.

The Victorian Naturalist :

THE JOURNAL AND MAGAZINE

— OF —

The Field Naturalists' Club of Victoria.

PUBLISHED 5th JULY, 1900.

Editor : F. G. A. BARNARD, Esq.

The Author of each article is responsible for the facts and opinions recorded.

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1900.

Field Naturalists' Club of Victoria.

ROOMS—ROYAL SOCIETY'S HALL, VICTORIA ST., MELBOURNE.

BUSINESS PAPER FOR MONTHLY MEETING.

Monday, 9th July, 1900, at Eight p.m.

1. Correspondence and Reports.

2. Election of Members.

	Proposer.	Seconder.
Mr. A. A. Brown (Vict Rly. Dept., Spencer St.)	J. Gabriel	G. A. Keartland
Mr. G. H. Robinson	D. M'Alpine	C. C. Brittlebank

3. Nominations for Membership.

Members making nominations will oblige by handing the full name and address to Hon. Secretary.

4. General Business.

5. Reading of Papers and Discussions thereon.

(Authors are requested to hand in a brief resume of their papers to the Secretary.)

1. By Mr. O. A. Sayce, (a) "Some peculiar Habits of Crabs." (b) "A Method of Preserving Crustacea."
2. By Mr. A. Campbell, "A Trip to the Richmond River District."

6. Reading of Natural History Notes.

Members who may note any unusual occurrence, or see anything of interest in Foreign or Colonial papers, are requested to inform the Secretary of the same that he may arrange for their bringing them before the meeting; such notes should however, be brief.

7. Exhibition of Specimens and Conversazione.

Members exhibiting specimens are requested to furnish the Hon. Secretary with written particulars of their Exhibits for record in Minutes and *Naturalist*.

* EXCURSION. *

SATURDAY, 14th JULY.—Zoological Gardens. Under the leadership of Mr. D. Le Souëf, C.M.Z.S. Meet there at main gates 2.30 p.m. Zoology.

PROGRAMME 1900—1901.

The Committee will be pleased to receive suggestions of Localities for Excursions for this year as early as possible.

Victorian Naturalist.

VOL. XVII.—No. 3. JULY 5, 1900.

No. 199.

FIELD NATURALISTS' CLUB OF VICTORIA.

THE twentieth annual meeting of the Club was held at the Royal Society's Hall on Monday evening, 11th June, 1900. Mr. T. S. Hall, M.A., one of the vice-presidents, occupied the chair, and about 50 members and visitors were present.

REPORTS.

A report of the excursion to Somerton on 24th May (Queen's Birthday), which, owing to unfavourable weather, was poorly attended, was forwarded by Mr. C. C. Brittlebank. The object of the excursion was to visit Aitken's Hill, about 16 miles almost due north of Melbourne, and the nearest extinct volcano, or volcanic vent, to the city. The hill was reached after a rather wet tramp across the paddocks from Somerton station. Ascending the hill a zone of dense black soil, marked by a luxuriant growth of thistles, was noted about a third of the distance up, which probably represents an ancient lip of the crater. Above this the soil was of a more or less red or chocolate colour. The top was found to be nearly circular, with a slight slope to the west. Numerous blocks and fragments of vesicular basalt were strewn on the summit, several greatly resembling the figure given by Darwin of a volcanic bomb. A wall of dense purple-grey basalt from a few feet to nine feet in height crops out round the lip, and can be distinctly traced round three sides of the summit. The distance from lip to lip was found to be about two hundred yards across, with dense black soil filling the crater, and judging from the country the lip was most probably broken down on the western side. To the west, north, and east basaltic plains stretch away from the foot of the hill for many miles, while on the southern side granite approaches within a quarter of a mile. The hill stands well above the surrounding country, and from its summit a splendid view of the Dividing Range was obtained. From Aitken's Hill a return was made *via* Craigieburn and Campbellfield to Coburg, various sections being inspected on the way, and altogether an interesting day was spent. About fifteen species of birds were noted, and large numbers of English Starlings were seen.

The hon. librarian acknowledged the receipt of the following additions to the library:—"Aquatic Insects," by Prof. Miall, purchased; "Birds of Kerguelen I.," by Robert Hall (reprint from the *Ibis*), from the author; "Monthly Progress Reports, Geological Survey of Victoria" (new series), Nos. 8, 9, and 10, from

Department of Mines, Victoria; "Proceedings Royal Society of Victoria," vol. xii. (new series), part 2, from the Society; "Thirty-sixth Annual Report Zoological and Acclimatisation Society of Victoria," 1899, from the Society; "Queensland Flora," part 1, by F. M. Bailey, F.L.S., Government Botanist, Queensland, from the author; *Queensland Agricultural Journal*, April and May, 1900, from Department of Agriculture, Queensland; "Proceedings Royal Society of Queensland," vol. xv., from the Society; *Nature Notes*, April and May, 1900, from Selborne Society, London; "Annual Report Smithsonian Institution," 1897, from the Institution; "Proceedings Boston Society of Natural History," vol. xxix., Nos. 1-8, from the Society; "Birds of Eastern North America—part 1, Water Birds; part 2, Land Birds"—from Field Columbian Museum, Chicago; "Field Columbian Museum—Zoological Series," vol. i., Nos. 16 and 17, from the Museum; "Bulletin of Buffalo Society of Natural History," vol. vi, Nos. 2, 3, and 4, from the Society; "Mangareva Dictionary, Gambier Island," by Edward Tregear, from the New Zealand Institute.

ELECTION OF MEMBER.

On a ballot being taken, Mr. C. J. Gabriel, Abbotsford, was duly elected a member of the Club.

ANNUAL REPORT.

The hon. secretary, Mr. G. Coghill, then read the twentieth annual report for 1899-1900, which was as follows:—

"To the Members of the Field Naturalists' Club of Victoria. Ladies and Gentlemen,—Your Committee have much pleasure in presenting the twentieth annual report of the Club, covering the year ending 30th April, 1900, showing, as it does, that the Club is in a good position and steadily gaining ground.

"The membership has increased to 147, consisting of 135 ordinary, 2 life, and 10 honorary members.

"We regret that early in the year death removed our patron, Sir Frederick M'Coy, K.C.M.G., well known as a distinguished palæontologist and zoologist. The rearrangement of his duties at the University, &c., has resulted in the appointment of Dr. J. W. Gregory as Professor of Geology, while the directorship of the National Museum has passed into the hands of one of our late presidents and a fellow-member, Professor W. Baldwin Spencer. Another member, Mr. J. A. Kershaw, has been promoted to the position of Zoological Curator of the Museum.

"The usual monthly meetings have been held, with always a good attendance of members; also an extra meeting, at which, to a large audience, Mr. J. H. Maiden, F.L.S., Government Botanist of New South Wales, delivered a lecture, entitled 'A Botanist on Mount Kosciusko,' illustrated by limelight pictures.

"The papers read have numbered 34, grouped as follows :—19 on zoological subjects, 11 on botanical, 1 on geological, and 3 on general subjects and trips. The authors were—Messrs. A. Campbell, jun., F. L. Billingham, E. E. Green, W. R. Guilfoyle, F.L.S., J. F. Haase, R. Hall, T. S. Hall, M.A., J. A. Kershaw, F.E.S., D. Le Souëf, C.M.Z.S., J. G. Luehmann, F.L.S., J. H. Maiden, F.L.S., D. M'Alpine, F. M. Reader, F.R.H.S., O. A. Sayce, H. T. Tisdall, and C. Walter, Rev. W. Fielder, and Professor W. Baldwin Spencer, besides which two papers by Mr. A. J. Campbell, one by Professor T. D. A. Cockerell, and one by Mr. A. J. North, C.M.Z.S., have been printed in the Club's journal.

"In addition, natural history notes have been read at every meeting, and the exhibits, which have been fairly numerous and good, have occasionally been commented upon.

"Another volume (the 16th) of the *Victorian Naturalist* has been edited by Mr. F. G. A. Barnard, and we must again record our thanks for his conscientious work. Illustrations for papers were supplied by Mr. A. J. North, Messrs. J. Shepherd and W. Stickland, and A. Campbell, jun.

"The excursions included a 'camp out' in the Lerderderg Ranges, under the secretaryship of Mr. A. Mattingley; and a three days' visit to Wallaby Creek, Plenty Ranges, by permission of the Metropolitan Board of Works, both of which were successfully carried out.

"The ordinary excursions have been only fairly attended. Members, and especially new ones, would find it of great advantage to join these more frequently, and thus also encourage the various leaders, who would, we are sure, feel better repaid by having more followers. The annual social picnic at Blackburn was again a great success.

"Five meetings for practical work have been held during the year. Of these Mr. F. G. A. Barnard took charge of one, and the Rev. W. Fielder of the four others. We trust that in the coming year more such meetings will be held.

"The thirteenth conversazione of the Club was held on the 18th and 19th May, 1899, and was most successfully carried through under the secretaryship of Mr. J. A. Kershaw, F.E.S., to whom, as also to the sub-committee in charge and the exhibitors, our thanks are due. As on previous occasions a charge for admission was made to non-members, which enabled your Committee to meet all expenses and have sufficient in hand to add two much-needed text-books to the library.

"The usual exhibition of wild flowers was held in conjunction with the October monthly meeting, and was fairly representative. The exhibitors were confined almost entirely to members of the Club.

"The meetings of the Australasian Association for the Advancement of Science, held in Melbourne in January last, were well attended by members of the Club, and at the January meeting of the Club we had the pleasure of welcoming several well-known naturalists from other colonies.

"An attempt was made by the Club to alter the close season for Quail by making the opening day a month later in the year, but the Minister for Customs declined to make the proposed alteration.

"We have to thank the various authors of papers, contributors of illustrations, leaders of excursions, and demonstrators of practical work for their aid in the work of the Club; Mr. E. H. Swan, of the Triumph Engraving Co., for supplying half-tone blocks; and Messrs. Morton and Coghill for the use of their offices for committee meetings.

"We extremely regret that the health of your hon. treasurer, Mr. J. T. Gillespie, has necessitated his visiting Queensland for a time, and he has consequently had to refuse nomination for his office. We desire to thank him for the good work he has done for the Club, and hope he will return at no distant date with renewed strength.

"The financial statement shows receipts for the year, including the balance brought forward, of £127 9s. 10d., and expenditure £123 7s. 7d., while the statement of assets and liabilities shows no outstanding debts. The year was commenced with a balance of £11 0s. 10d. in hand, £10 15s. of which was expended on a new bookcase, and now, with no liabilities, there is a credit balance of £4 2s. 3d., which we consider very satisfactory.

"While congratulating members on this sound position, we would remind them that the library suffers owing to lack of funds, there being very little money for the purchase of modern text-books. We would, therefore, ask each and all to introduce from among their friends as many new members as they can, and to endeavour to keep these by making our meetings as attractive as possible with their papers and exhibits.

"For the Committee of the F.N.C.,

"J. SHEPHARD, *President*.

"G. COGHILL, *Hon. Secretary*.

"Melbourne, 4th June, 1900."

The report was received, and, subject to the insertion of a paragraph recording the last conversazione, adopted, on the motion of Mr. D. Le Souëf, seconded by Mr. G. A. Kearnland.

FINANCIAL STATEMENT.

In the absence of the hon. treasurer, Mr. G. Coghill read the financial statement for 1899-1900, which was as follows:—

RECEIPTS.

To Balance, 30th April, 1899	...	...	...	£9 0 10
„ Subscriptions	...	...	£89 13 0	
„ <i>Victorian Naturalist</i> —				
Subscriptions	...	£5 19 5		
Sales	...	6 8 0		
Advertisements	...	9 0 0		
Reprints	...	2 0 6		
			23 7 11	
„ Surplus from <i>Conversazione</i>	...	3 6 4		
„ Sales of Surplus Books	...	0 1 9		
„ Refund of Deposit for Hall for <i>Con-</i>				
<i>versazione</i>	...	2 0 0		
			118 9 0	
			£127 9 10	

EXPENDITURE.

By <i>Victorian Naturalist</i> —				
Printing	...	£74 1 10		
Reprints	...	3 6 6		
			£77 8 4	
„ Rooms—Rent and Attendance	...	8 7 6		
„ Bookcase	...	10 15 0		
„ Library—Periodicals	...	5 13 6		
Books	...	3 18 8		
Binding	...	2 0 0		
Insurance	...	0 6 6		
			11 18 8	
„ Printing and Stationery	...	3 15 0		
„ Postages, &c.	...	9 14 7		
„ Wreath, Sir F. M'Coy's Funeral	...	1 1 0		
„ Subscription towards Medallion of late				
Baron von Mueller	...	0 7 6		
			£123 7 7	
„ Balance	...	4 2 3		
			£127 9 10	

J. T. GILLESPIE, *Hon. Treasurer.*
30th April, 1900.

Audited and found correct.

15th May, 1900.

J. H. GATLIFF, }
J. F. HAASE, } *Auditors.*

The following statement of assets and liabilities was also read :—

ASSETS.

Balance in hand	...	...	£4 2 3
Arrears of Subscriptions, say	...	...	27 19 6
Library and Bookcases	125 0 0
			£157 1 9

LIABILITIES.

Subscriptions Paid in Advance	£3 15 0
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On the motion of Mr. F. G. A. Barnard, seconded by Mr. J. Stickland, the statements were received and adopted.

LIBRARIAN'S REPORT.

The hon. librarian, Mr. O. A. Sayce, read the following report on the library for the past year :—

“ During the year 180 volumes and parts of proceedings, &c., were added to the library, in addition to the periodicals to which the Club subscribes. The erection of an additional bookcase has given ample space for the rearrangement of the books, the whole of which are now under glass. A number of parts have been bound into volumes, but further expenditure in this direction is desirable. Many valuable exchanges have been received, and two useful text-books have been purchased, but further expenditure in this direction is also desirable.”

The report was received and adopted, on the motion of Messrs. J. H. Gatliff and Robert Hall.

OFFICE-BEARERS FOR 1900-1.

The following office-bearers were declared duly elected, being the only nominations received :—President, Mr. J. Shephard ; vice-presidents, Messrs. T. S. Hall, M.A., and J. G. Luehmann, F.L.S. ; hon. treasurer, Mr. J. F. Haase ; hon. librarian, Mr. O. A. Sayce ; hon. secretary, Mr. G. Coghill ; hon. assistant secretary and librarian, Mr. D. Newport.

A ballot for five members of committee resulted in the election of Messrs. J. Gabriel, J. H. Gatliff, G. A. Keartland, J. A. Kershaw, F.E.S., and E. Le Souëf, C.M.Z.S.

A vote of thanks to the retiring office-bearers, proposed by Mr. F. G. A. Barnard, was carried by acclamation, and acknowledged by Mr. T. S. Hall, M.A., in the unavoidable absence of the president, Mr. J. Shephard.

PAPERS READ.

1. By Mr. J. H. Gatliff, entitled “ Notes on Some Victorian Marine Mollusca.”

The author renamed as *Odostomia petterdi* the shell formerly known as *Obeliscus tasmanica*, and recorded several additional Victorian Mollusca.

2. By Mr. G. B. Pritchard, communicated by Mr. J. H. Gatliff.

The author renamed as *Marginella tenisoni* the shell formerly known as *M. (Cryptospira) cypræoides*, and gave his reasons for the alteration.

3. By Mr. R. Hall, entitled “ Notes on the Great Skua Gull.”

The author gave some interesting notes on *Megalestris antarctica*, Lesson, the result of observations made during his visit to Kerguelen Island.

NATURAL HISTORY NOTES.

Mr. J. G. Luehmann, F.L.S., drew attention to his exhibit of *Arenaria axillaris* (Ord. Caryophyllæ), collected by Mr. St. Eloy D'Alton at Dimboola, and *Acrotriche ventricosa* (Ord. Epacridæ), collected by Mr. P. St. John near Lilydale, as plants new to science; and of *Scirpus prolifer*, var. *castanea* (Ord. Cyperacæ), collected by Mr. St. Eloy D'Alton at the Grampians.

Mr. A. Mattingley read a note drawing attention to the great value of the shrub *Hymenanthera banksii* as a fodder plant. Bullocks had thriven wonderfully on it when grass was scarce, and a pastoralist had informed him that he considered it of the utmost value.

Mr. D. Le Souëf, C.M.Z.S. reported an instance of a Wedge-tailed Eagle, *Uroaëtus audax*, having attacked a sheep-dog which was following its master along a bush track in Western Australia, and had it not been for the man's presence would probably have killed the dog, showing that these birds when pressed by hunger will attack animals larger and heavier than themselves, and which they cannot possibly carry away.

Mr. D. M'Alpine described a fungus, *Clathrella pusilla*, new for Victoria, which had recently been found by Mr. C. French, jun., at Sandringham.

EXHIBITS.

By Mr. F. G. A. Barnard.—Five species of Coccidæ, forwarded by Mr. J. Lidgett, including *Mytilaspis bicornis*, Green and Lidgett, from Launceston, Tasmania.

By Mr. A. Coles.—Egg of Collared Plain Wanderer, *Pedionomus torquatus*.

By Mr. C. French, F.L.S.—A remarkable Longicorn beetle, *Hypocephalus armatus*, from Cayenne.

By Mr. C. French, jun.—Plants of *Styphelia serrulata*, with exceptionally large flowers (Mitcham, 10/6/00).

By Mr. C. J. Gabriel.—Marine shells, including *Spondylus regius* and *S. princeps*, mostly from Gulf of California; also, *Fusus pyrulatus*, from Western Port.

By Mr. J. H. Gatliff.—Marine shells, *Odostomia petterdi* and *Marginella tenisoni*, in illustration of papers.

By Mr. R. Hall and Dr. C. Ryan.—Osprey—3 phases: nestling, young, and adult.

By Mr. G. A. Keartland.—Eggs of various birds of prey, including *Uroaëtus audax*, Wedge-tailed Eagle; *Nisaëtus morphnoides*, Little Eagle; *Haliaëtus leucogaster*, White-bellied Sea Eagle; *Haliastur girrenera*, White-headed Sea Eagle; *H. spheonurus*, Whistling Eagle; *Falco melanogenys*, Black-cheeked Falcon; *F. hypoleucus*, Grey Falcon; *F. subniger*, Black Falcon; *F. lunulatus*, Little Falcon; *Hieracidea berigera*, Striped Brown Hawk; and *H. orientalis*, Brown Hawk.

By Mr. J. G. Luehmann, F.L.S.—Dried plants—*Arenaria axillaris* and *Acrotriche ventricosa*, new to science, and *Scirpus prolifer*, var. *castanea*, new for Victoria.

By Mr. D. M'Alpine, F.C.S.—Fungus, *Clathrella pusilla*, new for Victoria.

By Mr. F. Pitcher.—Cocksfoot Grass seed, *Dactylis glomerata*, growing from seed head; two specimens of Fungus, growing on "Take-alls;" and skin of Native Bat.

By Mr. F. M. Reader.—Dried specimens of *Lepidosperma viscidum*, R. Br.; *Panicum sanguinale*, L.; *Myoporum insulare*, L.; and *Trisetum subspicatum*, Palis., all unrecorded for the N.W. of Victoria.

By Dr. C. Ryan (per Mr. C. French, jun.)—Rare nest and eggs of Keartland's Honey-eater; also eggs of Rifle-bird, from Richmond River, N.S.W.

By Mr. Chas. Walter.—Dried plants—*Stipa muelleri*, Tate, new for Victoria, from Wannon Valley, Grampians, collected by H. B. Williamson; new localities—*Lepturus incurvatus* and *L. cylindrius*, S.W. Victoria, H. B. Williamson coll.; *Ixiolæna leptolepis*, Benth., Keilor Plains, C. Walter coll. Also rare plants—*Rutidosia leptorrhynchoides*, F. v. M., Keilor Plains, C. Walter coll.; *Erechtites quadridentata*, De C., variety *glabrescens*, Benth., Sandringham, C. French, jun., coll., and for comparison *E. quadridentata*, narrow-leaved variety, Werribee River.

After the usual conversazione, the meeting terminated.

SOME ORNITHOLOGICAL NOTES.

(Concluded.)

BY ROBERT HALL.

(Read before the Field Naturalists' Club of Victoria, 12th February, 1900.)

3. A TREE-BUILDING PARDALOTE SAID TO BE FOSTER-PARENT TO A CUCKOO.

Two birds have been handed to me by Mr. Hedley Coles, with the information that he saw the Pardalote, *P. assimilis*, Ramsay, feeding one young Pardalote and a young Bronze Cuckoo, *Chalcococcyx plagosus*, Lath., upon a bough at Carrum on 25th December last. I know of no case in which a Pardalote has been known to act as foster-parent to any of the Cuculidæ, but as the young Cuckoo here mentioned was actually fed by the Pardalote (skins of both on the table), and by all appearances was in good fellowship with young and old, I mention the incident, and wait for further information of similar cases. In the meantime it opens certain interesting considerations. Why should a young Cuckoo and a young Pardalote be peacefully fed together by parent Pardalotes? It is quite unusual, but the evidence is

strongly in favour of their having come from the same nest in certain timber. Though for a cuckoo to place its egg in the hollow of a tree, where the Pardalote's eggs would be placed, is like putting it in an uncanny place. How many Pardalotes there were about this spot when all were collected is not known, so that one cannot say how many matured, but it is unlikely that more than one Pardalote succeeded in living through the ordeal of having a young pugilist in its company. Judging by what we know of Cuckoos, the egg would be laid about the time the first egg of the Pardalote was laid. Following this there would be five more eggs of the Pardalote laid. The Cuckoo's egg would early start to develop, and would hatch out days earlier than the first egg, and considerably before the last. History would now repeat itself, and that young Cuckoo would simply starve the others, if it could not throw them out, which would be most unlikely in this case. To see one young Pardalote only with one young Cuckoo and foster-parents is to me the same as seeing the sole surviving member of six young Pardalotes. I know very well that a hungry young Cuckoo would try to wrestle from the foster-parents each insect as it was brought in until it was satisfied, which would not be till a late hour. Mr. Coles observed a nest a few feet above the birds when being fed, which had the small entrance in the bole, the deep cavity, and usual carbonate of lime indications. From these circumstances it is my opinion this young Cuckoo suffocated or starved all its fellow-lodgers, the Pardalotes, except one, and that one escaped as much by good fortune as good management.

4. ADDITIONAL INFORMATION ON THE PLUMAGE OF MALURUS CYANEUS, ELLIS.

In the "Proceedings of the Royal Society of Victoria," vol. xii. (N.S.), 1899, part 1, I described some twenty phases of plumage in the life-history of certain Maluri. Another has recently come under my notice which is of particular value, since it is assuming the aspect of age while it is yet very young. The skin was obtained at Elsternwick in June by Mr. Hedley Coles, and is that of a male bird. The general appearance dorsally is brown, but greyish-white ventrally. The bill is chocolate brown on the distal half of the upper mandible, and along all but a small proximal part of the lower, while it is black over the inner half of the upper mandible. The lores are dull rufous, with a black feather in each. The tail is brown, without any appearance of light blue upon it. The feet are pale chestnut. One black feather appears in the mantle, and several blue ones on the head and cheeks. Length of wing, 1.8 inches; length of tail, 1.55 inches. Except for the "blues," a casual observer would tell you at once it was a young bird a few months old, and most likely a female;

but the single black feather on the mantle, and those on the lores, as well as the blues, indicate at once that it is a precocious bird. I had always understood that the bill needed to be blacker and the tail faint blue, which would require a few more months of modest garb before any "finery" became the prevailing element. Would this bird rear a family this spring? I think not, because it is the opinion of my friend Mr. Graham, who has given the question considerable attention (*Vict. Nat.* xvi, p. 135) that the young female of the first year does not. Mr. Graham has had under strict observation a mother and a daughter wren of *Malurus gouldi* for fourteen months, and they have both been feeding during the last two weeks (December, 1899) a new brood of the mother's. Next spring, doubtless, the daughter will mate, but whether this observation is the rule or the exception is not quite certain.

In the article in the "Proceedings of the Royal Society of Victoria," previously referred to, a slight error occurs. In the thirteenth line from the bottom of page 89 the word "females" should read "males."

AN UNRECORDED SPECIES OF BURSARIA.

By W. R. GUILFOYLE, F.L.S., Director Melbourne Botanic Gardens.

(Communicated by H. T. Tisdall.)

(Read before the Field Naturalists' Club of Victoria, 10th April, 1900.)

THE genus *Bursaria* — order Pittosporæ — was founded by Cavanilles in 1797 on a single species, *B. spinosa*. Two other species have since been described, namely, *B. incana*, Lindley, and *B. tenuifolia*, Bailey. In Mueller's "Census of Australian Plants" the first named only is mentioned, and is recorded as indigenous to North, South, and West Australia, Queensland, New South Wales, Victoria, and Tasmania.

That an error has long existed in regarding the Victorian tree *Bursaria* and the very spiny, loosely-branched shrub so common in the hilly and mountainous districts of the colony as the same species, or that one is but a mere variety of the other, will be freely admitted by all field naturalists who may choose to examine the plants carefully. At least it must be conceded that there are as sound reasons for giving specific rank to the plant in question as to any of the other three.

BURSARIA PANTONI (after J. A. Panton, C.M.G., P.M.), Guilfoyle, Native Box-olive Wood.

A tree averaging from 37 to 45 feet in height, with a very dense head of dark olive-green foliage; circumference of stem often 50 inches. Bark very rough and dark. Branchlets corrugated, lenticles

numerous. Spines extremely rare, or altogether wanting. Leaves oblong-cuneate, 1 to 2 inches long, the broadest $\frac{3}{4}$ inch wide near the very obtuse end, margins entire. Flowers small, white, in dense terminal slightly hoary panicles about 2 to $2\frac{1}{2}$ inches long and broad. Capsules similar to those of *B. spinosa*.

This species differs from *B. spinosa*, Cav., in its arborescent growth, larger leaves, absence of spines, and smaller and more dense panicles. From *B. incana*, Lindl., in the absence of the white hoary tomentum, and its smaller flowers and capsules. The northern species, *B. tenuifolia*, Bail., has rather larger leaves of a thinner texture, long petioles, and large but not dense panicles.

Hab.—Near Melbourne to beyond Sale in Gippsland, and many other parts of Victoria, crossing the border into South Australia. Wood hard, close-grained, suitable for carving and turnery work. A good substitute for Engravers' Box or Turkey Box, *Buxus sempervirens*.

SOME NOTES OF A TRIP TO THE VICTORIAN ALPS.

BY J. H. MAIDEN, F.L.S., Government Botanist of New South Wales.

(Communicated by F. G. A. Barnard.)

(Read before the Field Naturalists' Club of Victoria, 14th May, 1900.)

AMONGST the many attractions in connection with the session of the Australasian Association for the Advancement of Science held in Melbourne in January last was a trip to the Victorian Alps. I gave early notice, in order that I might not be crowded out, but when the expedition started I found myself in supreme command, the leader, main body, and rearguard, &c., &c., being represented by myself.

A most interesting account of a similar trip by Mr. Chas. Walter will be found in the *Victorian Naturalist* for September last. This forms an excellent itinerary, and my short paper may be read in conjunction with that of Mr. Walter, for I do not intend to repeat anything that that gentleman has said.

The trip may be conveniently divided into three parts:

- 1.—Bright and the Bright district.
- 2.—Harrietville to the Mt. St. Bernard Hospice.
- 3.—The Hospice to the summit of Mount Hotham.

The country I passed over affords a good idea of the flora. One might have ascended other mountains, *e.g.*, Mt. Feathertop, but these would not have yielded further treasures, and are solely of interest to the alpine climber. In the Bright district I went to Wandiligong and Mongrel Creek, to the Buckland Valley and Buckland River (Lower Buckland), several miles along the Tawonga road, and to Porepunkah and Eurobin.

First let me say a word or two about the weeds. This is a fertile and salubrious district, consequently weeds grow apace ; so do the rabbits. I have seldom seen so many rabbits in a similar area in New South Wales as I did about Bright. And a settler on the Tawonga road told me that the rabbits now were "nothing" compared to what they were a few years ago.

Hypericum perforatum, Linn., "St. John's Wort," is very abundant in paddocks and along the side of the road, the district being over large areas ablaze with its yellow flowers. It is a small shrub 1 to 2 feet high, which my driver called the pest of the district. It does not appear to have been hitherto formally recorded in any catalogue of Victorian weeds. It appeared at intervals all up the mountain. Blackberries are rampant. I saw hedges of them ten yards across in many places. While driving along a quiet road I came across a large family, *minus* father and mother. The baby, in its perambulator, was in the middle of the road, and was making itself a little Ethiopian with the aid of a dipper of blackberries. The children had ladders, milk pails, dippers, and tin mugs, were of the same colour as the baby, and informed me that they were gathering the fruit for sale, but hadn't begun yet. The Sweet Briar is nearly as big a pest as the Blackberry. Other common weeds are the Star Thistle, *Centaurea calcitrapa*, Linn. ; the Black Thistle, *Carduus lanceolatus*, Linn. ; the Variegated Thistle, *Carduus marianus*, Linn. ; and the Burr, *Acena sanguisorba*, Vahl., a real annoyance here and most of the way up the mountain. English Musk, *Mimulus moschatus*, was found abundantly (at the soak), also at Freeburgh, in the water race, 4 miles from Bright, thoroughly acclimatized. It occurs, in fact, right up the mountain, and I shall not readily forget the delicious perfume of large masses of it on a damp, cloudy morning ; its odour is more marked than that of our numerous musks of the genus *Olearia*.

The Mullein, *Verbascum blattaria*, Linn., keeps the *Hypericum* company about Bright and right up the mountain. It is really a beautiful plant, if one can forget what a widely diffused weed it is.

Turning to the introduced plants which are not weeds, one cannot but be struck with the beauty of the Elms. They are a feature of the pretty township, and so are the Poplars. English trees in general flourish in the district. I saw some Red Clover, but some of the finest I have ever seen in my life was up the mountain, about two miles from the Hospice. Another indication of the temperate climate is the fine hop gardens near Harrietville—a most interesting sight. I noticed smaller hop gardens on the Tawonga and Morse's Creek roads, but I understand that hops are not grown in the district so much as formerly. On one of my rambles I got into conversation with a farmer. I

mentioned hops, and he mentioned federation. He voted against federation last time, and was going to jump on it with both feet; we couldn't compete against Tasmania in hop-growing, and he was going to be ruined. This was almost the only grumbling I heard on a long trip.

The Eucalypts observed by me in the immediate neighbourhood of Bright were *E. amygdalina*, *stellulata*, *coriacea*, *sieberiana*, *gunnii*, *stuartiana*, and *viminalis*—a poor lot of timber trees. *Acacia pravissima*, F. v. M., is very abundant—a shapely, small tree; it must be handsome when in full flower. The Silver Wattle, *A. dealbata*, Link., is also common, and *Leptospermum lanigerum* and *L. scoparium* appeared to be the commonest Tea-trees.

On the way to Eurobin the White Gum, *E. viminalis*, has the flowers, in some cases, in more than threes. *Bæckia crenatifolia*, F. v. M., found near Eurobin Falls, is a shrub with drooping foliage and white flowers, and is, I believe, the most beautiful plant I met with in the whole of my trip; this is high praise. I went to the Buckland River, 13 miles, and had a fine view of Buffalo Range on our right. (The guide books will fill in this hiatus.) I noticed a marvellous number of rabbits, and this is very poor collecting ground for the botanist—it could hardly be worse, consisting chiefly of *E. amygdalina* (Peppermint), bracken, and so forth.

Near Wandiligong I collected *Olearia glandulosa*, Benth., and *Callistemon pithyoides*, Miq., both in a swamp, while *Cassinia aculeata*, R. Br., was common along the road. Here and at other parts of the district I noticed a “swamp gum,” a form of *E. gunnii*. *E. amygdalina* was in enormous preponderance, but there was some Apple, *E. stuartiana*. *Lomaria alpina*, Spreng., occurs at Wandiligong, which appears low. It is a fern which ascends to the summit of Mt. Kosciusko, and is found on most of the Alpine mountains.

On the Tawonga road I noticed *Coprosma billardieri*, J. Hook., *Grevillea alpina*, Lindl., *Pomaderris apetala*, Labill., *Lythrum salicaria*, Linn., and *Correa lawrenciana*, J. Hook.—large handsome bushes, here and at the Buckland. *Bursaria spinosa*, Cav., of North-Eastern Victoria, is found on the banks of watercourses or on flats, and is a far handsomer tree than as it occurs in the greater portion of New South Wales. It is well worthy of cultivation for its large masses of creamy white blossoms, which exhale a pleasing perfume.

We now undertake the most important part of the trip—from Harrietville to the Hospice on Mt. St. Bernard. The journey is a most impressive one, the scenery being grand beyond description, while the air, particularly on a cloudy morning, is redolent of Eucalyptus—in this instance chiefly the pleasing-scented *E.*

sieberiana. The *Hypericum*, already referred to, occurs all the way to the Hospice and down the Dargo track, and so do some other weeds, showing how steadily they become acclimatized. The English Musk I have already alluded to, while Yorkshire Fog, *Holcus lanatus*, is not uncommon about half-way up. The following plants were observed :—A very viscid *Helichrysum*, *H. stirlingi*, F. v. M. ; *Olearia megalophylla*, F. v. M. ; *Cassinia longifolia*, R. Br., and *aculeata*, R. Br. (the latter particularly abundant) ; *Celmisia longifolia*, Cass. ; while the banks were often yellow with *Senecio australis*, Willd. Of *Persoonias* there were *P. media*, R. Br., *P. revoluta*, Sieb., and *P. chamæpeuce*, Lhot. On the old track I noticed the viscid *Acacia leprosa*, Sieb. Along the moist cuttings *Lobelia gibbosa*, Labill., was not rare ; there were a few shrubs of *Gaultheria hispida*, R. Br. ; *Pimelea pauciflora*, R. Br., was common, and so also was *Coprosma hirtella*, Labill. The leafless orchid, *Dipodium punctatum*, R. Br., was seen, while *Deyeuxia scabra*, Benth., and *Danthonia penicillata*, F. v. M., appeared to be the commonest of the grasses. *Daviesia corymbosa*, Sm., was very abundant, even as high as the Hospice and beyond. At 4,000 feet I saw one with a trunk 6 inches in diameter. *Grevillea victoriae*, F. v. M., occurs near the Hospice and for 1,000 feet lower. *Acacia mollissima*, Willd., was observed as high as 5,000 feet ; *Eriostemon myoporoides*, D. C. (known locally as Daphne), was seen only 500 feet lower than the Hospice, while there are some fine shrubs of *Leptospermum myrsinoides*, Schlecht, at the Hospice water supply. On the Dargo River, about a mile from and several hundred feet below the Hospice, is *Prostanthera lasiantha*, Labill., of an unusually deep purple colour, rendering it a beautiful flower for table decorations.

Just a word or two about the Eucalypts. *E. dives*, Schauer, was seen in moderate abundance near the first spring. This species has not previously been recorded for Victoria. There are dense forests of straight young trees, principally of Mountain Ash, *E. sieberiana*, F. v. M., for the greater part of the ascent. While this is the predominant species in these ranges, *E. gunnii*, J. Hook., was not rare, and in some places plentiful. *E. coriacea*, A. Cunn., a White or Cabbage Gum, is markedly pink-barked a few miles out of Harrietville on the ascent. *E. coriacea*, *E. sieberiana*, and *E. gunnii* are the three Eucalypts which are found on high situations in the Alps ; finally *E. coriacea* is left, this species alone forming the "tree line."

A few words in regard to the highest part of my trip, from the Hospice at Mt. St. Bernard to Mt. Hotham, and I have done. *E. coriacea* is apparently the only gum that ascends higher than the Hospice ; on the highest peaks it is stunted and very glaucous, and is known as "Snow Gum."

On the way to the summit of Mt. Hotham I met with three plants that I have vainly hunted for on Mt. Kosciusko; Mueller mentions them on the Muniong Ranges—perhaps he refers to the southern slopes of Mt. Kosciusko, for I do not think they can be on the northern. I allude to the scrambling *Acacia alpina*, F. v. M., which the old miners call “Wait-a-while,” from the toughness of its very spreading branches; the pink-flowering *Boronia algida*, F. v. M., and *Westringia senifolia*, F. v. M. The first two are in great profusion, while the third is not rare. *Stylidium graminifolium*, Sw., and *Wahlenbergia gracilis*, D. C., have flowers much more highly coloured than at lower elevations. There is abundance of *Olearia stellulata*, D. C., with pale purple flowers. What a charming plant for the rockery or border this particular form—dwarf, and a mass of flowers—would be! *Stellaria pungens*, Brongn., was common here, and there was a little *Dianella tasmanica*, J. Hook., though the plants lacked the robustness and the gorgeousness of those I had seen on Mt. Kosciusko.

At the Diamantina Springs the hand of man was abundantly evident by the presence of our old European friend, *Chenopodium murale*, Linn. Mt. Hotham (6,100 feet) is a rather unromantic mountain, with cattle roaming over it eating down the botanical specimens. The flies made one almost crazy. The summit is crowned by a small, badly-made cairn, surmounted by a small stick. There are no large rocks on the top of the mountain, as is frequently the case with the highest peaks of the Australian Alps. The predominant vegetation, all of which is dwarf, appeared to be *Kunzea muelleri*, Benth.; but there were also *Grevillea australis*, R. Br., and *Epacris microphylla*, R. Br., as on Mt. Kosciusko, in abundance.

Let me compare my impressions of the highest parts of the Victorian and New South Wales Alps. The former consist of peaks, ridges, gullies, and ravines, and there is comparative absence of water. There are, however, “high plains” at Dargo and Bogong, over 4,000 feet, but these I did not see. The highest parts of the New South Wales Alps consist of “plains” plentifully bestrewn with granite boulders, plenty of water—streams, lagoons, and swamps—as there is perpetual snow; the limit is about 6,500 feet, which is just above the highest point of the Victorian Alps. There is, in consequence, a rich moss flora, but I collected few on the Victorian Alps.

In conclusion, let me advise every Victorian botanist to visit the Victorian Alps. He will gain health and expansion of ideas, while he will return laden with a richly filled vasculum. To me this all-too-short trip forms a happy episode in a happy life.

FIELD NOTES ON THE HOUSE SWALLOW AND WHITE-THROATED THICKHEAD.

BY ROBERT HALL.

(Read before the Field Naturalists' Club of Victoria, 14th May, 1900.)

CLOSE observations in the field of our most common insectivorous birds will generally yield some new and interesting facts. Even with so common a bird as the House Swallow, *Hirundo neoxena*, Gould, the subject has by no means yet been exhausted. Recently I have been interested in this bird and a member of the genus *Pachycephala*, *P. gutturalis*, Lath., White-throated Thickhead, and it is pleasing to get results such as the young of *H. neoxena*, requiring twenty-three to thirty days in the nest in preparation for their later life, while those of *P. gutturalis* need only eleven days to effect the same purpose. Further, the young Thickheads remain in the nest only two days after the eyes have opened, and when they are away from the nest the adult male takes full charge of the young male, the female adult doing the same with the young female. Young Thickheads generally remain in the scrub in the vicinity of the nest for several weeks, while young Swallows fly considerable distances in the day as soon as they leave the nest, and because of their extra strength they can be fed while upon the wing.

(a.) *HIRUNDO NEOXENA*, Gould, House Swallow.

The European Swallow, *Hirundo rustica*, Brisson, winters partly in Southern Asia. The sub-species of it, *H. gutturalis*, Sonn., is a North-eastern Asiatic bird that winters in the Austro-Malayan sub-region, occasionally reaching the north coast of Australia (Sharpe). *H. tytleri*, Jerdon, is a second sub-species, said by Professor Newton to occasionally reach Australia in winter from Eastern Siberia, its summer home. *H. javanica*, Sparrm., is a species located, broadly speaking, between Southern India, New Guinea, and the islands of Torres Strait, while *H. neoxena*, Gould, is the Australian species.

While *H. rustica* never touches Australia, it is but rarely that *H. gutturalis* and *H. tytleri* do so. Up to 1885 one specimen only of *H. javanica* had been found in Australia, and that practically upon a severed portion of it (Thursday Island), thus giving us an opportunity to treat it in our lists more as a visitor to than as a species of our continent. *H. neoxena* is our common bird. All are closely allied, each apparently keeping as a whole to its marked area, and only occasionally "telescoping or trespassing" on another's ground, just as our Magpie Lark, *Grallina picata*, did recently in the Archipelago to the north of us (*Ibis*, Jan., 1900).

It is to the well-known form of our continent that the following notes refer, and I am pleased to again acknowledge the careful observations of my correspondent, Mr. Geo. Graham, of Heytesbury Forest.

While comparing the experiments of Mr. Wm. Evans, F.R.S.E. (*Ibis*, 1891, p. 60), made in the incubation of eggs of *Hirundo rustica* with those made in *H. neoxena* in this paper, it is to be noted they show the same results, although Mr. Evans in the first place took each egg from the nest when laid, replacing the four eggs on the fifth day, when the fifth egg was laid, and when the bird had fairly started to incubate, and in the second place removed the eggs to an incubator two days before two of them [only two fertile (?)] hatched. Two nests watched showed fifteen days as the time of incubation from laying of last egg. The eggs in our nests took fifteen days, and they were neither removed in the initial nor concluding stages, while all hatched out. The observations "twelve days if fine, seventeen days if cold or wet," as noted in Cassell's "Birds," ii., p. 107, are not borne out by the experiments made in either Northern or Southern Hemisphere. It is interesting to know that the House-Swallow in England hatches its eggs in exactly the same time as the one in Victoria.

The following four observations show—(a) an egg is laid on each consecutive day, (b) the clutch takes fifteen days to incubate, (c) they only open their eyes on the ninth day, (d) the young left the nests in Observation I. in twenty-four days, in Observation IV. in thirty days.

Observation I.—August-September, 1899, Heytesbury, Vic.

The birds commenced additions to last year's nest in a much-weathered hollow at base of eucalyptus trunk on 6th August, and by the 13th inst. a new tier of plaster, one inch deep, was laid. Immediately following this an inner lining of rabbit's fur, feathers, &c., was fixed in ample time for the first egg, which was deposited in the nest on 23rd August, the second on the 24th, the third on the 25th, the fourth on the 26th, and the fifth on the 27th.

The bird immediately "sat," and brought out five young on the 11th September. On the 4th of October the young left the nest for the first time.

Observation II.—September, 1899, Heytesbury, Vic.

As an experiment, the old nest was broken away and taken quite out of sight of the birds. This gave an opportunity to find the time required to build a complete nest. The operation commenced on 7th September, and by the 19th inst. the earthen cup was finished. By the 30th inst. the lining was fixed and an egg was laid. Without giving any clear explanation the owners made

no further advance with this nest, and the single egg remained uncubated.

Observation III.—October-November, 1899, Heytesbury, Vic.

The first egg was deposited in the nest on 12th October, and a second on the following day. Several days' watching showed no further development, so, considering the nest was abandoned, the observation ceased; but passing the nest some weeks later two young were found to be progressing favourably.

Observation IV.—October-December, 1899, Heytesbury, Vic.

Nest in bole of a eucalyptus. The second egg was deposited on 18th October, the third on 19th, and fourth on 20th. By analogy, with this species, the first egg was laid on the 17th October. On 5th November the young hatched out, their bodies being rather nude, and the down grey. The eyes opened on 14th November; young growing rapidly on 17th November, quills well out, and showing grey tufts. By the 19th inst the grey is giving way to black, with chocolate on throat and vent. At this stage the young are so strong, and cling so tenaciously to the nest, that it is dangerous to take them out for examination, especially on the 22nd inst., when the crown and back are dull black. On 5th December the young left the nest for the first time.

Young.—The provodoring for the young necessitates each parent visiting the nest every three minutes. This is done alternately, judging by twenty visits to the nest in one hour, of which each sex makes ten. If only one nestling is supplied at a time the five in the family would each be fed every fifteen minutes.

After the young have quitted the nest for the first time they return during the heat of the day for several days following.

The part of the "pipe" in the tree above the nest serves the family as a night camp for ten to twelve days after the young have left the nest for the first time. The non-sitting bird camps in a place apart from the nest during the period the nest is tenanted. While the majority of the birds leave the district during the early autumn a few remain, and then the old birds sing or twitter as well apparently as in the spring. It is not unlikely this is a training for the remaining young in preparation for the following spring and summer.

Eggs Undeveloped.—When it is found a clutch of eggs will not develop, certain birds, such as the Magpie, *Gymnorhina tibicen*, place a false flooring to the nest, thus covering the eggs, and immediately lay again. Judging from the following note it is most probable the Swallow does not come under this head, but under the one where birds turn out their eggs when proved valueless. The nests are used for several years, generally about one inch of plaster to each rim being added annually and new

lining is yearly placed on the top of the old. Thus, finally, the structure will rise more than twelve inches above the first foundation. "In a hollow trunk that has been used for fifteen years," writes Mr. Graham, "I found the nest freshly lined with feathers. Shortly afterwards I felt an egg in it, and on the following day two additional, thus proving either carelessness in my touch or that three eggs were laid in forty-eight hours. I do not believe an error was made on my part. On the fifteenth day all three eggs disappeared. About nine days later three more eggs were found in the nest, and they are there now (weeks later), probably infertile, as doubtless were the others. There are no rats, cats, or bird-nesting boys in this neighbourhood, so I venture to think the birds, finding no young came on the appointed day (fifteenth), threw them out."

Nesting Habits.—The species starts to nest in July if the weather be favourable (27/7/96, Box Hill), though the month will vary with the latitude. It is an early and late breeder—thus, March, 1900, three clutches of fresh eggs in cave in Philip Island by Mr. Wilson. The position chosen for the nest is a very varied one, such as in caves, spouts of trees over water, barns, under verandahs, and even in a dog-kennel, if the dog has been absent some time; in this latter position the bird has been known to breed for five years (Mr. C. Gabriel). Even the floating caisson of the Williamstown Graving Dock has its nest, under one of the iron ledges.

Whether or not the birds resort to the same nest annually I cannot say, but since 1881 two nests in the same hollow of a tree have been occupied each year during the whole sixteen or seventeen years to 1898. One of these nests was pulled down in the sixteenth year, prior to spring, and was not rebuilt. I take it the birds were turned aside from the usual custom and went elsewhere. It is not unlikely these nests passed from parent to offspring. In the building of a nest the birds occasionally make a mistake and persist in doing so. If the nest falls they start again and a second time it may fall. On other occasions nests are partially built and abandoned. A pair will start a nest and by the time it is half done a number of Swallows assemble, fly to and from the nest, twitter considerably, and work is suspended apparently as a consequence. Such nests are not again touched.

Introduced Enemies.—The fox and cat from the mother country cause considerable trouble among our birds. The cat at the moment is raiding the dry parts of north-western Australia just as the fox is doing in the south-eastern portion. Near Swan Hill I know the hall of a country house that has a nest in it, and two nails below upon which the two birds perch in the dusk. In the six weeks previous to 1st October, 1898, seven birds were killed

by the cat that kept its place in this lobby. If one of a pair was caught the mate would go away for from one to three days, and return with a consort. In a day or more one of that pair would be captured, and away the other would go for a mate and return with it. As to which sex was killed no one could say, but I should think the same one, and every time the stranger, thus showing the persistency of one bird to follow up an idea, just as one of the same species will start to rebuild its nest after it has been purposely knocked down on four occasions within a month.

In those districts where swallows build mostly in burnt-out trees, the fox makes a thorough inspection, and all that are not more than six to eight feet above the ground sooner or later are precipitated—sometimes when empty, at others when containing the sitting bird. The fox will jump or scramble up the distance, and grasp in its mouth nest and bird. It seems most unfortunate that this scourge should have got among our terrestrial fauna, of which that beautiful form the Lyre-bird has not suffered least.

(b) *PACHYCEPHALA GUTTURALIS*, Latham, White-throated Thick-head.

“The *Pachycephala gutturalis* may be regarded as the type of this genus, the members of which are peculiar to Australia and the adjacent islands to the northward. Their habits differ from those of most other insectivorous birds, particularly in their quiet mode of hopping about and traversing the branches of the trees in search of insects and their larvæ; caterpillars constitute a great portion of their food.” This was Mr. John Gould’s impression of the representative species under present notice.

As recently described by the writer before the Royal Society of Victoria, this species has three phases of plumage, very distinctly different—(a) rufous, (b) grey, (c) yellow, black, white, and grey.

Mr. Graham now corroborates what I there expressed, by closely observing the male grey bird of nest II., as under, to have a trace of the black pectoral collar only and the merest speck of abdominal yellow. The male of this pair of breeders when first seen, e.g., when selecting a covert in which to build (10th October, approx.) appeared uniform grey and darker upon the crown. The pectoral collar could only be faintly distinguished on the 10th of December.

To watch a pair that is not in nuptial plumage is easy enough when it has selected the portion of dense covert it intends to occupy with the nest. Like many birds, they have a way of letting you know the place is sacred to them for a season.

Nesting Habits.

Observation I.—September-October, 1899, Heytesbury, Vic.

25th September.—First egg laid in nest.

26th September.—Second egg laid in nest.

12th October.—Young hatch out, having a little reddish down on body.

16th October.—Grey quills rise from wings, tail, and along ridge of back

20th October.—Rufous feathers growing rapidly on wings and back.

21st October.—Eyes of young open ; feathers forming on breast and neck.

23rd October.—Young leave nest ; feathers formed on crown.

Observation II.—October-November, 1899, Heytesbury, Vic.

15th October.—Building of nest commenced, the female alone doing the work from start to finish.

28th October.—Nest completed, and first egg deposited in it.

29th October.—Second egg laid.

14th November.—Young birds hatch out of shells.

23rd November.—Eyes open.

25th November.—Young leave the nest.

29th November.—Young birds are separated, each parent taking charge of one, and one exclusively feeding it. The wings have assumed a darker colour.

The male alone feeds its charge (the young male), the female doing the same with the young female bird. The young come to receive food at the calls of the guardians, each obeying the call of its particular one. No cross purposes seem to be entertained as regards food.

A young bird from a nest in Box Hill, when caged, for twelve days following freely caught flies upon the bars of the cage, largely living upon them in preference to other food supplied.

A phase of this first plumage I believe to be hitherto unrecorded is the throat of the rusty-brown bird becoming greyish-white (Feb., 1897), while, from what I have seen in the field, another phase when handled would, I believe, show the throat to be rusty-brown, the last place with the exception of the wings to remain rusty-brown in the complete change from phase 1 to phase 2. An example of the February phase of bird above was held under observation by Mr. Graham until 25th July, losing sight of it only between the 18th and 25th July. This inclines me to believe that the rusty-brown or first plumage is retained for more than six months, and that it gives way to the grey or second phase in time for the first breeding season, a season of immature and very modest plumage. The want of competition surely is the male bird's champion.

Phase 3, of a male that must be at least two years of age, is an elegant one. I met with one on the Bass River that was quite an exception to "bright plumage indicating weak power of song," for it had so wonderful a voice that when I heard the ringing music I felt entranced, and although years have passed, so delightful was it that it still seems to ring with the full enjoyment of that time. During the same week I met with a second specimen of this bird with phenomenal voice at Lang Lang, but only on those two occasions have I heard the strong, sweet, clear, and regular series of running notes.

Judging from specimens seen in June and July, it is a winter resident of the most southern portions of the continent.

NOTE ON SOME VICTORIAN MARINE MOLLUSCA.

By J. H. GATLIFF.

(Read before the Field Naturalists' Club of Victoria, 11th June, 1900.)

ODOSTOMIA PETTERDI, J. H. Gatliff (*nom. mut.*)

1884. *Obeliscus tasmanica*, Petterd (*non* T. Woods), Jour. of Conch., p. 140.

1886. *Pyramidella tasmanica*, Tryon, Man. of Conch., vol. viii., p. 303, there included in his list of unfigured species of *Pyramidella*.

Hab.—Flinders, San Remo, Western Port.

Observations.—This shell was named by W. F. Petterd, and defined as an *Obeliscus*. It is undoubtedly an *Odostomia*, and as the specific name of *tasmanica* was used by the Rev. J. E. Tenison Woods in 1876 in Proc. Roy. Soc. of Tas., 1876, p. 29, I have pleasure in renaming it after the finder.

The following species have been recently found on our coast, and I am not aware that they have yet been recorded as being indigenous :—

- Daphnella crebriplicata*, Reeve.
- Columbella* (*Æsopus*) *filosa*, Angas.
- Natica nana*, T. Woods.
- Eulima commensalis*, Tate.
- Eulima indiscreta*, Tate.
- Eulima marginata*, T. Woods.
- Eulima* (*Hypermastus*) *coxi*, Pilsbry.

The three first mentioned were obtained by myself and Mr. C. J. Gabriel, off Rhyll, Phillip Island, Western Port, and the others by myself on the beach near Shoreham, Western Port.

NOTE ON NEW NAME FOR A VICTORIAN
MARGINELLA.

BY G. B. PRITCHARD.

(Communicated by J. H. Gatliff.)

(Read before the Field Naturalists' Club of Victoria, 11th June, 1900.)

MARGINELLA TENISONI, G. B. Pritchard (*nom. mut.*)1877. *Marginella* (*Cryptospira*) *cypræoides*, T. Woods (*non* Anton, 1839), Proc. Roy. Soc. Tas., p. 122.1883. *Marginella* (*Glabella*) *cypræoides*, Tryon, Man. of Conch., vol. v., p. 23.*Hab.*—Sorrento (Ocean Beach), Shoreham Beach, Western Port, Port Phillip, Portland.*Observations.*—The above specific name of the Rev. J. E. Tenison Woods was preoccupied for a distinct species in the above genus as early as 1839 by H. E. Anton. The work by the latter author, entitled "Verzeichniss der Conchylien," appears either to have been overlooked or ignored by subsequent writers, and as I have a copy of the work and find the name on p. 99, together with a description of the species, I have no choice but to conform to the usual practice adopted in such cases, and therefore change the name as above.

VICTORIAN MOLLUSCA.—The following are the rarer species of marine Mollusca obtained by Messrs. J. H. Gatliff and C. J. Gabriel during a dredging excursion off Rhyll, Western Port Bay, in April last, and exhibited at the May meeting of the Field Naturalists' Club:—*Murex angasi* and 2 other species, *Typhis yatesi*, *Lotorium bassi* and 4 other species, *Fusus pyrulatus* and *dunkeri*, *Mitra vincentiana* and *franciscana*, *Marginella halli* and 4 other species, *Ancilla oblonga* and 2 other species, *Columbella filosa* and 4 other species; *Cancellaria*, 3 species; *Drillia quoyi*, *gabrielii*, *æmula*; *Clathurella sexdentata*, *Raphitoma harrisoni*, *Cithara cognata* and *compta*, and other *Pleurotomids*; *Conus rutilus*, *Cypræa angustata*, varieties; *Natica beddomei* and *subcostata*, and 3 other species; *Turritella acuta*, *Turbonilla fusca*, *Liotia tasmanica*, *Zemira australis*, *Trichotropis gabrielii*, *Callistoma incertus*; a very fine *Chiton*, not yet identified; *Emarginula*, 2 species; *Myodora ovata*, *Cardium pulchellum* and *cygnorum*, *Trigonia dubia*, *Nucula grayii*, *Limatula bullata*, and a number of *Pecten asperimus* with sponge adhering, upon removal of which very fine varieties of colouration were disclosed.

A FUNGUS NEW FOR VICTORIA.—*Clathrella pusilla*, Ed. Fischer. Small, with slender rooting portion. Volva obovate, dirty white, smooth, $\frac{1}{2}$ – $\frac{3}{4}$ in. diameter. Receptacle bright salmon colour, elongated, about $1\frac{1}{2}$ in. high, consisting of vertical branches united at the apex, transversely rugose, interstices elongated slits. Spores minute, hyaline, embedded in greenish slime, elongated

elliptical, $5\frac{1}{2}$ – $7\frac{1}{2} \times 2$ – $2\frac{1}{2} \mu$, growing in the ground but appearing just above it. May, 1900. Sandringham, Victoria; C. French, jun. This species has only hitherto been found in Queensland and Western Australia, and is therefore new for Victoria. It was originally placed in the genus *Clathrus* by Berkeley, but on account of the delicate branches of the receptacle, and consisting of a few layers of chambers, it was placed under *Clathrella*, constituted by Fischer.—D. M'ALPINE.

SOUTH AUSTRALIAN ORNITHOLOGICAL ASSOCIATION.—A meeting of this Association, under the presidency of Dr. A. M. Morgan, was held on 4th June, 1900, when further consideration was given to the society's list of local names for birds. A number of interesting exhibits were shown.

PERSONAL ITEMS.—Members will be pleased to learn that Professor Baldwin Spencer, M.A., one of our former presidents, and long actively connected with the Club, has been nominated by the Council of the Royal Society of London for election as a Fellow of the Society. He has also been elected an Hon. Corresponding Member of the Anthropological Institute of London.

Messrs. C. French, F.L.S., D. Le Souëf, C.M.Z.S., and A. J. Campbell have been requested by the Department of Agriculture to act as a Board to inquire into the merits of the different suggestions sent in for the destruction of sparrows, in response to the reward offered by the Borung Shire Council.

Mr. C. French, jun., has received promotion in his department, having been appointed Assistant Government Entomologist.

We have to congratulate Mr. H. P. C. Ashworth, one of our former hon. secretaries, whose health unfortunately prevents him from at present taking an active part in natural history work, on being, along with a fellow-officer in the Railway Department, the winner of the first prize in the competition for designs for the new Flinders-street Railway Station, Melbourne.

Mr. J. T. Gillespie writes from Brisbane to say that his health has been much improved by his trip to the north. While in Townsville he met Mr. E. M. Cornwall, one of the early members of the Club, who desired to be remembered to Melbourne friends.

Among the members of the first Victorian Contingent for the South African war was Private Lindsay Inglis, a former member of the Club. During the engagement in which Major Eddy was killed he was unfortunate enough to have his knee and leg shattered, but had sufficiently recovered to be invalided home with the first batch of returned soldiers.

Mr. Donald Macdonald, the talented war correspondent and lecturer, was some years ago noted for his natural history sketches. These were afterwards collected and published under the title of "Gum Boughs and Wattle Blossom," and being of a distinctly local character, are worthy of perusal by every nature lover.

Field Naturalists' Club of Victoria.

* OFFICE-BEARERS, 1900-1901. *

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MR. J. A. KERSHAW, F.E.S., and MR. D. Le SOUEF, C.M.Z.S.

* OBJECTS. *

THIS CLUB was founded in 1880 for the purpose of affording observers and lovers of Nature History regular and frequent opportunities for discussing those special subjects in which they are mutually interested; for the exhibition of Specimens; and for promoting Observations in the Field by means of Excursions to various collecting grounds around the Metropolis.

PRACTICAL EVENING.

MONDAY, 23RD JULY.

The first of a course of four, on Botany, by
Mr. H. T. TISDALL, dealing with—

Thallophytes—Algae (Seaweeds), Type *Homosira*

„ *Fungi* (Moulds and Mushrooms), Type
Agaricus, *Mucor*

The others will be on—

2nd. *Muscineae—Marchantia*, Moss

Vascular Cryptogams—(Fern, the Common Bracken)

3rd. *Gymnosperm—Pinus*

Angiosperm—Monocotyledon (Grass or Lily)

4th. *Dicotyledons* { *Cruciferae* (The Turnip family)
Solanaceae (The Tobacco and
Potato family).

On dates to be announced.

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VOL. XVII.—No. 4.

AUGUST, 1900.

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THE JOURNAL AND MAGAZINE

— OF —

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The Author of each article is responsible for the facts and opinions recorded.

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Field Naturalists' Club of Victoria.

ROOMS—ROYAL SOCIETY'S HALL, VICTORIA ST., MELBOURNE.

BUSINESS PAPER FOR MONTHLY MEETING.

Monday, 13th August, 1900, at Eight p.m.

1. Correspondence and Reports.

2. Nominations for Membership.

Members making nominations will oblige by handing the full name and address to Hon. Secretary.

3. General Business.

4. Reading of Papers and Discussions thereon.

(Authors are requested to hand in a brief resume of their papers to the Secretary.)

1. By Mr. J. G. Luehmann, F.L.S., "Eucalyptus kitsoni," a new species of Eucalypt from S. Gippsland.
2. By Mr. D. M'Alpine, "Note on Habits of Myxomycete—*Diachæa elegans*, Fries."
3. By Mr. C. C. Brittlebank, "The Silurian Rocks of the Upper Werribee" (illustrated).
4. By Mr. A. Campbell, "A Trip to the Richmond River District" (illustrated by Limelight Views).

5. Reading of Natural History Notes.

Members who may note any unusual occurrence, or see anything of interest in Foreign or Colonial papers, are requested to inform the Secretary of the same that he may arrange for their bringing them before the meeting; such notes should however, be brief.

6. Exhibition of Specimens and Conversazione.

Members exhibiting specimens are requested to furnish the Hon. Secretary with written particulars of their Exhibits for record in Minutes and *Naturalist*.

✻ EXCURSIONS. ✻

SATURDAY, 18th AUGUST.—Heidelberg. Leaders: Messrs. H. T. Tisdall and J. Stickland. Meet at Collingwood Station 2.15 p.m. Botany and Pond Life.

SATURDAY, 1st SEPTEMBER.—Botanical Gardens. Leader: Mr. F. Pitcher. Meet there at office 2.30 p.m. Botany.

(Excursion Programme with this NATURALIST.)

THE
Victorian Naturalist.

VOL. XVII.—No. 4. AUGUST 9, 1900.

No. 200.

FIELD NATURALISTS' CLUB OF VICTORIA.

THE ordinary monthly meeting of the Club was held at the Royal Society's Hall on Monday evening, 9th July, 1900. The president, Mr. J. Shephard, occupied the chair, and about 50 members and visitors were present.

REPORT.

A report of the visit to the National Herbarium, on Saturday, 16th June, was given by Mr. F. G. A. Barnard, who said that an interesting afternoon had been spent there. The Curator, Mr. J. G. Luehmann, F.L.S., had pointed out the general arrangement of the herbarium, and given some valuable information as to the acquirement of many of the specimens, several of particular interest being displayed for the inspection of the members. Afterwards a hurried glance was given to the many valuable works contained in the library.

ELECTION OF MEMBERS.

On a ballot being taken, Messrs. A. A. Brown (Victorian Railway Department, Spencer-street) and G. H. Robinson were elected members of the Club.

GENERAL BUSINESS.

The President referred to the great honour done to natural science in Victoria by the nomination of Professor Baldwin Spencer, a past president of the Club, for the fellowship of the Royal Society of Victoria; and on behalf of Mrs. E. Bage, who was unavoidably absent, Mr. F. G. A. Barnard moved—"That the congratulations of the Club be offered to Professor Spencer on his having been nominated for the distinction of F.R.S., and that this meeting trusts he may be one of the selected recipients." This was seconded by Mr. J. Gabriel, and carried by acclamation.

Mr. F. G. A. Barnard drew attention to the approach of the flowering season of the wattles, and moved that the secretary be directed to write to the daily papers, and also to the Minister of Lands, asking their assistance in preventing the great destruction of the trees which usually takes place. The resolution was seconded by Mr. H. T. Tisdall, and carried unanimously.

PAPERS READ.

1. By Mr. O. A. Sayce, entitled "Some Peculiar Habits of Crabs."

The author drew attention to the ability of the sharp-snouted crabs (*Oxyrrhynchus*) to clothe themselves, as a means of protection from their enemies, with materials similar to their surround-

ings, such as Sponges, Algæ, and even Sea-Anemones, which they are said to be able to remove at will, and exhibited specimens in illustration of his remarks.

2. By Mr. O. A. Sayce, entitled "On a Method of Preserving Crustacea."

The author described a practical method of preserving Crustacea by means of a mixture of glycerine, spirit, and corrosive sublimate, which was also applicable to Sea-Urchins, Star-fish, and even Brittle Stars, by which they were kept in a perfectly flexible condition without the necessity of being enclosed in specimen jars or other closed vessels, and exhibited a large series of specimens which had undergone the treatment described.

Several members spoke enthusiastically of the method, and predicted a great revolution in the method of preserving and exhibiting several classes of natural history objects.

3. By Mr. A. Campbell, jun., entitled "A Trip to the Richmond River District."

The author gave a general description of the Richmond River district, N.S.W., and gave some account of the principal botanical features of the "Big Scrub," leaving the birds and the butterflies for a future paper.

NATURAL HISTORY NOTES.

Mr. G. A. Kearthland drew attention to his exhibit of a pair of live Collared Plain Wanderers, *Pedionomus torquatus*. The birds were captured recently by a friend when out quail-shooting. His dog "stood" at them as they squatted in short grass, and when approached they made no effort to escape. Though the female had been taken only eight days, she was now so tame as to take worms from the hand. He had on several previous occasions known birds of this species to make no attempt to escape when approached.

Mr. F. G. A. Barnard drew attention to the volume on Natural History of the "Concise Knowledge Library" laid on the table by him, as a book which, from its reasonable cost and great dictionary value, should be in the library of every field naturalist.

EXHIBITS.

By Mr. F. G. A. Barnard.—A simple form of section-cutter for microscopical work.

By Mr. C. French.—Shells, *Melo miltonis*, from Western Australia.

By Mr. C. J. Gabriel.—Shells from Northern Europe, including *Linia excavata*, *Pecten islandicus*, *P. septemradiatus*, *Antalis striolata* (dredged at 300 fathoms deep); also case of Victorian Pectens, *P. asperrimus*, *P. laticostatus*, and *P. bifrons*.

By Mr. D. Le Souëf.—Native Gourd from North Queensland.

By Mr. F. M. Reader.—Dried plants, *Setaria glauca*, un-

recorded for N.W. Victoria, and *Haloragis elata*, unrecorded for S.W. Victoria.

By Mr. A. O. Sayce.—A large crab, *Pseudocarcinus gigas*, from Portland, and other Crustacea (preserved), in illustration of his papers.

By Mr. J. Stickland.—Swimming Crab from Sandringham.

By Messrs. Tisdall and Maplestone.—Orchid, *Prasophyllum despectans*, J. Hooker, collected at Eltham, 8/7/1900.

By Mr. C. Walter.—Dried plants, *Scirpus prolifer*, new for Victoria, from Fyan's Creek, Hall's Gap, Grampians, collected by Mr. St. Eloy d'Alton, previously known only from New South Wales, extending from Port Jackson to New England; *Carex longifolia*, Glenelg River, new for S.W. Victoria, collected by Mr. H. B. Williamson; *Correa aemula*, Mount Buck, Orbost district, East Gippsland, collected by Mr. Ed. E. Prescott, previously recorded in Victoria from the Grampians only.

After the usual conversazione the meeting terminated.

THE DISTRIBUTION OF AUSTRALIAN BIRDS— ADDITIONAL RECORDS.

BY ROBERT HALL.

(Read before the Field Naturalists' Club of Victoria, 9th April, 1900.)

DURING a recent visit to Western and South Australia I noticed in the museums in Perth and Adelaide a number of birds, collected in their respective colonies, of species which had not been recorded in my recent work, "A Key to the Birds of Australia and Tasmania," as occurring in the areas corresponding to those colonies. These are additional to Dr. Ramsay's "Tabular List of Australian Birds," 1888, and Mr. A. J. Campbell's critical review of it published in the *Victorian Naturalist*, vol. v., page 78; and further additions were afterwards published by Mr. Campbell in the "Proceedings of the Royal Society of Edinburgh." The majority of the skins of the species mentioned I have handled, while fifteen species are included on the authority of Dr. Morgan, Adelaide, Mr. Thomas Carter, Western Australia, and Mr. S. W. Jackson, New South Wales, who have personally identified skins of species in the respective areas in which they live. Certain other species have already been referred to in a paper read by me at the meeting of the Australasian Association for the Advancement of Science held in Melbourne in January last.

The areas concerned in these additional records are :—3, South Queensland, including Richmond and Clarence Rivers, N.S.W. ; 6, adjacent areas of Victoria, New South Wales, and South Australia ; 8, North-West Australia ; and 9, Western Australia.

Many of the birds now recorded for area 6 appear in Dr.

Ramsay's Tabular List as occurring in his province 12, which comprises the colonies of Victoria and South Australia. In severing these two colonies into what appeared to me to be correct avi-faunal areas I was at the time unable to trace in area 6 certain birds which I knew to occur in the eastern portion of Victoria, but an examination of the bird skins in the South Australian Museum, through the courtesy of Professor Stirling and the assistance of Mr. Zeitz, now enables me to add a number of species to that area.

Several of the birds are found to be particularly interesting in their distribution. Among the following are five species which are thoroughly migratory, and have been hitherto regarded as taking their course along the eastern side of Australia. The more noticeable are:—430, *Micropus pacificus*, now recorded from Derby, North-West Australia; 441, *Eurystomus australis*, previously considered accidental in the north-west, but on further evidence must now be recorded as more stationary; 449, *Dacelo cervina*, recorded from a little to the north-east of Perth; 487, *Cacatua sanguinea*, from the immediate north of Adelaide, its most southerly limit; 528, *Neophema petrophila*, from Port Lincoln, the locality through which south-eastern birds have probably passed into south-western Australia; 546, 547, *Geopelia humeralis* and *G. tranquilla*, now practically invest the continent, without penetrating to the central area; 571, *Turnix varia*, hitherto uncertain as a western bird, but I handled a skin of it at the Perth Museum from the Abrolhos Islands, where I also saw flocks of it; 589, *Gallinula tenebrosa*, from near Perth; 608, *Charadrius dominicus*, from the western coast; 613, *Ægialitis hiaticola*, has been recorded only once for Australia, and then as occurring in area 4 (south-eastern Australia)—now, according to Mr. Woodward, of the Perth Museum, it has been taken on the Abrolhos Islands, leading me to think, as Dr. Ramsay did, that it is the Ceylon bird, *Æ. jerdoni*, Legge; 628, *Heteractitis brevipes*, previously recorded from Eastern Australia, now showing with others here recorded a migratory course from the Malay Archipelago along the western as well as the eastern side of the continent; 653, *Sterna melananauchen*, generally considered to be a Pacific Ocean bird, or one that follows the course of the monsoon as far as the Andaman Islands in the Indian Ocean, has now been found much further south, on the western coast, having been previously known only from the north and north-eastern coasts.

Reviewing the additions to the various areas, it will be seen that the additional species recorded for area 3 are mostly extensions of the southern limits of northern birds from area 2, as nests and eggs of all but 65, *Sphæcotheres flaviventris*, have been taken in the dense scrubs of the Brisbane, Clarence, or Richmond

Rivers. The additions to area 6 are for the most part extensions from area 4. Coming to area 8 we find that nearly all the additional species are common to area 1 (Northern Territory proper) or in a smaller degree to area 7 (Central Australia), thus further supporting the theory that area 8 is the final extension westward of area 2 (North Queensland) through area 1; and that those birds common to areas 8 and 9 are also common to areas 7 and 9, the two latter forming the central route for the expansion from area 3. The additions to area 9 are about one-half land birds, and the rest principally wandering water birds, and it will be noticed that the land birds are mostly immigrants from areas 6 and 7 rather than from area 8.

I append lists of the different species numbered to correspond with "A Key to the Birds of Australia and Tasmania," arranged under their respective areas, and I gratefully acknowledge the assistance given me by Mr. Bernard Woodward, Director of the Perth Museum, W.A., who also supplied most of the localities mentioned under area 9.

ADDITIONAL RECORDS FOR AREA 3—SOUTHERN QUEENSLAND.

- 26. *Accipiter cirrhocephalus*, Vieill.
- 65. *Sphecotheres flaviventris*, Gld.
- 113. *Pœcilodryas superciliosa*, Gld.
- 156. *Monarcha melanopsis*, Vieill.
- 162. *Geocichla heinii*, Cabani.
- 358. *Manorhina melanophrys*, Lath.
- 375. *Dicæum hirundinaceum*, Shaw.

ADDITIONAL RECORDS FOR AREA 6—ADJACENT PORTIONS OF VICTORIA, NEW SOUTH WALES, AND SOUTH AUSTRALIA.

- 39. *Strix flammea*, Linn.
- 96. *Petroeca rhodinogastra*, Drap.
- 117. *Malurus cyaneus*, Ellis.
- 183. *Megalurus gramineus*, Gld.
- 186. *Cisticola exilis*, V. and H.
- 205. *Sericornis maculata*, Gld.
- 299. *Acanthorhynchus tenuirostris*, Lath.
- 307. *Melithreptus lunulatus*, Shaw.
- 310. *M. gularis*, Gld.
- 336. *Ptilotis chrysops*, Lath.
- 353. *Meliornis australasiana*, Shaw.
- 354. *M. novæ-hollandiæ*, Lath.
- 360. *Manorhina garrula*, Lath.
- 361. *M. flavigula*, Gld.
- 365. *Acanthochæra mellivora*, Lath.
- 412. *Ægintha temporalis*, Lath.
- 443. *Alcyone azurea*, Lath.

- 487. *Cacatua sanguinea*, Gld.
- 525. *Neophema venusta*, Temm.
- 528. *N. petrophila*, Gld.
- 597. *Stiltia isabella*, Vieill.
- 644. *Hydroprogne caspia*, Pall.
- 651. *Sterna nereis*, Gld.
- 716. *Demiegretta sacra*, Gmel.
- 754. *Nettion castaneum*, Eyton.

ADDITIONAL RECORDS FOR AREA 8—NORTH-WEST AUSTRALIA.

- 7. *Lophoictinia isura*, Gld. Broome.
- 13. *Falco hypoleucus*, Gld. Broome.
- 22. *Astur novæ-hollandiæ*, Gmel. Kimberley.
- 29. *Ninox boobook*, Lath. Leonard River.
- 32. *Ninox connivens*, Lath. Broome and Leonard River.
- 63. *Oriolus affinis*, Gld. Derby.
- 75. *Pinarolestes parvulus*, Gld. N.W.A. (Gould).
- 77. *Pteropodocys phasianella*, Gld. Derby.
- 93. *Petroeca goodenovii*, V. and H. Kimberley.
- 275. *Pachycephala simplex*, Gld. N.W.A. (Gould).
- 289. *Sittella pileata*, Gld. N.W.A. (Gould).
- 295. *Myzomela erythrocephala*, Gld. Broome.
- 310. *Melithreptus gularis*, Gld. Broome.
- 373. *Philemon citreogularis*, Gld. Derby.
- 393. *Artamus personatus*, Gld. Broome.
- 394. *A. cinereus*, Vieill. Broome.
- 409. *Munia flaviprymna*, Gld. N.W.A. (Gould).
- 429. *Pitta iris*, Gld. N.W.A. (Gould).
- 430. *Micropus pacificus*, Lath. Derby.
- 441. *Eurystomus australis*, Swains. Broome.
- 643. *Gelochelidon anglica*, Mont. Broome.
- 644. *Hydroprogne caspia*, Pall. Broome.
- 706. *Platibis flavipes*, Gld. Broome.
- 716. *Demiegretta sacra*, Gmel. Broome.

ADDITIONAL RECORDS FOR AREA 9—WESTERN AUSTRALIA.

- 26. *Accipiter cirrhocephalus*, Vieill. Geraldton and Perth.
- 126. *Malurus amabilis*, Gld. Carnarvon.
- 184. *Megalurus galactotes*, Temm. Pt. Cloates (lat. 22 1/2 S.)
- 193. *Acanthiza pyrrhopygia*, Gld. W.A. (Gould).
- 240. *Xerophila pectoralis*, Gld. S.W.A. (Gould).
- 242. *Sphenostoma cristatum*, Gld. Geraldton.
- 305. *Zosterops lutea*, Gld. Pt. Cloates (Thos. Carter).
- 347. *Ptilotis leilavalensis*, North. Geraldton. (*P. carteri*, Camp.)
- 388. *Petrochelidon nigricans*, Vieill. W.A. (E. P. Ramsay).
- 437. *Podargus strigoides*, Lath. Perth (E. A. C. Le Souëf).

449. *Dacelo cervina*, Gld. Perth.
 492. *Calopsittacus novæ-hollandiæ*, Gmel. Dongarra.
 521. *Psephotus chrysopterygius*, Gld. Carnarvon.
 546. *Geopelia humeralis*, Temm. Dongarra.
 547. *Geopelia tranquilla*, Gld. Mingenew.
 571. *Turnix varia*, Lath. Abrolhos Islands.
 589. *Gallinula tenebrosa*, Gld. Herdman's Lake, Perth (W. B. Woodward).
 596. *Orthorhamphus magnirostris*, Vieill. Pt. Cloates (T. Carter).
 607. *Squatarola helvetica*, Linn. W.A., Abrolhos (Ramsay).
 608. *Charadrius dominicus*, Müll. Pt. Cloates (T. Carter).
 609. *Ochthodromus bicinctus*, Jard. and Selb. W.A. (Ramsay).
 612. *O. veredus*, Gld. Pt. Cloates (T. Carter).
 613. *Ægialitis hiaticola*, Linn. Abrolhos Islands.
 628. *Heteractitis brevipes*, Pallas. *Vict. Nat.*, April, 1899 (A. J. Campbell); Houtman's Abrolhos, 1899.
 640. *Calidris arenaria*, Linn. Pt. Cloates.
 653. *Sterna melanauchen*, Temm. Abrolhos Islands.
 703. *Carphibis spinicollis*, Jam. Busselton.
 704. *Plegadis falcinellus*, Linn. Katanning (W. K. Adam).
 716. *Demigretta sacra*, Gmel. Abrolhos Islands.
 717. *Nycticorax caledonicus*, Gmel. Augusta.
 720. *Ardetta pusilla*, Vieill. Monger's Lake, Perth.
 729. *Plotus novæ-hollandiæ*, Gld. Collie.
 735. *Fregata ariel*, Gld. Pt. Cloates.
 736. *Phaethon rubricauda*, Bodd. Rottnest.
 737. *P. lepturus*, Daudin. Abrolhos (A. J. Campbell).
 739. *Podicipes novæ-hollandiæ*, Steph. Katanning.
 750. *Dendrocycna arcuata*, Cuv. Monger's Lake, Perth.

SUMMER DAYS AT FLINDERS.

PART I.—A COLLECTION OF SPONGES.

BY REV. W. FIELDER, F.R.M.S.

(Read before the Field Naturalists' Club of Victoria, 12th March, 1900.)

FLINDERS, from its position, has many attractions. Stretching northwards from West Head, which serves as a kind of break-water between the ocean on the one hand and the waters of Western Port Bay on the other, is a rocky reef which is partly uncovered at low tide. This reef forms a veritable paradise to the marine zoologist. Its proximity to the shore—it can be reached at very low tide by wading little more than ankle-deep—its sheltered position, and its very formation of fairly loose blocks of moderately soft stone, render it, without

exception, one of the most accessible haunts of attractive zoological specimens to be found on the Victorian coast.

I propose, therefore, in a series of short papers, to consider, in their zoological order, three or four groups which are well represented in the marine fauna of this particular locality. And as a mere list of names will be of little interest or value, I hope to describe what may be regarded as typical examples of these predominating groups, and show, as far as space will permit, the relationship of the members of such groups, and the principles upon which the classifications are made.

We commence with the Phylum *Porifera* or *Sponges*, the reef furnishing examples illustrating the principal sub-classes of this group. Attached to the under surface of the loose stones or safely moored to firmer support between the loose boulders; forming a delicate and, in some cases, gorgeous covering to the rock or a disguise to a tiny crab; growing, plantlike, amongst the delicate sea-grass or upon more vigorous sea-weeds, sponges meet us everywhere. They interest us because of their varying sizes, some being so small as to be almost microscopic in size, others so large that we have a difficulty in enclosing them with both hands. They attract attention on account of their variety in colour, some being of deep purple whilst others are of golden hue; some escape notice amongst the seaweed because of their delicate green colour, whilst others are white as driven snow. They excite curiosity because of their diversity of form, some of the smallest being perched on a stalk, the body of the sponge being shaped like a small pine-apple, whilst others stand up from the stones to which they are fixed like miniature columns or chimney-pots; others again are compact and fan-like in shape, whilst others present delicate finger-like processes to view. They surprise us also because of differences in texture, some being as soft as velvet, whilst others are as hard as wood.

Such diversity in size and colour, form and texture, prompt the question, Are they animals or plants?

This same question was asked of Aristotle more than 2,000 years ago, and from his answer we may conclude that he was practically convinced that they were animals. It was not, however, till the end of the last century that English naturalists had any definite theory to put forth on the subject. In 1762 Mr. Ellis, a London merchant, classed them as animals from his observations on the circulation of water through them, and a very early edition of the "Encyclopedia Britannica," 1797, which contains a reference to his work, describes them as a "genus of animals belonging to the class *Vermes* and order of *Zoophytes*." It is, however, only in comparatively recent times, and after the most patient labour and exact methods of microscopical study that their true place in nature, as belonging to the great division in the animal kingdom,

viz., *Metazoa*, or many-celled animals, has been definitely established. We shall be able, with the abundant material at our disposal, and with the aid of a strong magnifying glass, a glass tumbler, a sharp razor, a deep watch-glass, and a little patient watching, to discover some of the facts upon which their present classification is based.

One of the most convenient forms to take for examination will be a specimen of the cylindrical variety belonging to the family *Syconidae*. These forms are found attached to the under surface of loose stones, and are usually about 1 inch in length, and yellowish-brown in colour. They can easily be detached from the stone by the point of a knife, and transferred to a vessel containing salt water. Sometimes they attach themselves to pieces of sea-weed, and in this case the weed and sponge can be transferred together to the vessel, thus affording a better opportunity for examination than if separated from its support. On reaching home, transfer the sponge to a watch-glass or shallow glass vessel, so that it is well within focus of the hand lens, and after the sponge has become accustomed to its new surroundings a current of water will be seen issuing from the top of it. This will be the more evident if a pinch of powdered carmine is added to the water, and as the current is fairly constant hour after hour, it is evident that its source must be constant too. If the hand lens is powerful enough smaller currents will be seen setting in towards the sides of the sponge and these form the source of supply to the larger current. The actual course taken by the current is not very evident, however, till we remove the sponge from the water, and with a sharp razor make a longitudinal cut through the very centre of it. This reveals the fact of a central cavity, the *gastral cavity*, extending from the bottom to the top of the sponge, the cavity being closed at the bottom and open at the top. Another fact, not quite so evident, however, can be made out, namely, that there are tiny breaks in the continuity of the wall which lead into minute open spaces. This rough-and-ready method of examination will not furnish much information about the actual direction of the current, but more exact work with proper appliances reveals much more, and we are able to trace, step by step, the exact course of the stream of water through the tiny openings or *pores* in the skin of the sponge to the central cavity—in fact, to establish a definite canal-system which may be regarded as the *circulatory system*, commencing at the pores and ending at the outlet at the top of the sponge through what is known as the *osculum*. In man the circulatory system is a closed one, in the sponge it is open; in man oxygen and nutrient material are carried to every part and parcel of the body by means of the circulatory system; in the sponge the sea water courses through the canal-system, carrying not only the

oxygen which is necessary for the continual oxidation of every part of the sponge, but also particles of nutrient material which will ultimately be absorbed by the special cells set apart for digestive purposes.

And this leads us to ask for a more detailed knowledge of the system concerned in the *alimentation* of the sponge. Some of the necessary details for this knowledge can be gained by recourse to a few thin sections cut transversely with an ordinary razor through one of the cylindrical sponges. If these sections are placed in a shallow vessel the central gastral cavity is at once apparent, and radiating from it towards the margin of the section thimble-like spaces are seen, whilst between adjacent spaces is a thin texture of gelatinous material in which are embedded spicules of lime of various shapes and sizes matted together in a definite manner to form a support to the spaces lying near to it. The special arrangement of the spicules, like links in a suit of chain-armour, to form the skeleton, allows, as we shall see afterwards, of a free course to any water entering or leaving the sponge. For the present we must leave the consideration of the skeleton and confine our attention to the part played by the thimble-like chambers in the very necessary duty of keeping the sponge alive. Our rough sections will not furnish the necessary details, but if by special methods of staining and embedding in paraffin we are able to obtain sections the $\frac{1}{1000}$ in. thick we see at once that these chambers are lined by a very specialized kind of cell, known from peculiar appendages it possesses as a "*flagellate collared cell*," and giving to the chambers to which they are confined the name of *flagellate chambers*.

These *collared cells* play such an important part in the economy of sponges that we must have a very clear conception of their structure before we can enter, with intelligence, into the everyday-life of such a sponge as we are now considering. They are exceedingly minute in size, so small that from 5,000 to 10,000 of them placed close together side by side would only form a line one inch in length, and yet so wonderfully formed as to be able not only to capture the food particles, but also to digest the same in a manner analogous to the digestive cells of animals infinitely removed from them in the animal kingdom. Typically, a collared cell consists of a rounded or sometimes cylindrical body produced above into a neck. The neck is surmounted by a comparatively long vibratile whip-like *flagellum* which is surrounded by a very delicate transparent membranous *collar* which is usually more or less funnel-shaped and inserted in the neck around the flagellum. In the body of the cell is a specialized part of the protoplasm, which shows a great affinity for the staining material used in the preparation of the section, known as the *nucleus*, and lying near to it are one or two open spaces called

contractile vacuoles. As far as I know, these collared cells have never been seen in the act of feeding in the sponge itself, but there is an animal (*Monosiga gracilis*) belonging to the great division of the animal kingdom known as *Protozoa* or *one-celled animals*, which is almost identical in structure to the collared cell of the sponge, and the feeding habits of this form have been very carefully observed. When in action, the flagellum projects freely through and beyond the cavity of the funnel-shaped collar, and being in constant movement to and fro with a swinging motion causes a current of water whose general direction is towards the collar. By means of this current the animal secures its food. All sorts of minute particles are carried against the collar. These particles, however, do not remain stationary in the spot where they come into contact but are carried irresistibly up the outside of the funnel to the edge of the opening, then over the edge and down the inside till they reach the body of the animal at the bottom of the funnel when they are engulfed in the soft protoplasm; the nutrient material is taken up by the protoplasm, and the waste matter probably excreted by means of the contractile vacuoles.

We are now in a position to understand a few more details about the canal-system of the sponge. We have already learned that the water enters through minute pores in the outer layer, and that, somehow or other, it finds its way through the fairly thick wall into the central cavity. The wall, as we have seen, is made up of the flagellate chambers together with the gelatinous material and embedded spicules which form the boundary or supporting structures to the chambers, and the water passes freely through the wall in a very definite course. Why does it take that course? Minute examination of the wall of the flagellate chambers elicits the fact that at intervals between the collared cells which make up the wall small holes or *prosopyles* occur through which water can easily pass when impelled to do so by the violent movement of thousands of the minute vibratile processes of the collared cells. This accumulated movement is the motive power of the current. As the water sweeps through these tiny holes and bathes the wall of the chamber studded with the cells the food particles are detained by the protoplasmic collars and by them transmitted to the digestive portion of the cell. The water thus robbed of its nutrient material, and bearing with it the rejected portions of the food particles, passes through the chamber to join the general current which issues from the gastral cavity at the top of the sponge. To summarize the course of the current we may refer to its entry by the pores and so into minute irregular channels, *inhalent canals*, which penetrate the gelatinous material and reach the wall of the flagellate chambers; then through small holes or *prosopyles* in the wall of the chambers; then through the

chambers and out by *exhalent canals* into the gastral cavity, and so, finally, to the *osculum* at the top of the sponge. That, in short, constitutes the canal-system of practically every sponge. Modifications, of course, occur in the different groups and sub-groups. In some, the inhalent canals are long whilst the exhalent canals are short, and *vice versa* ; in others, the flagellate chambers are spherical instead of cylindrical, being served direct with an inhalent and exhalent canal. But, in all, the same plan holds—an *inhalent* current carrying oxygen and nutrient material and an *exhalent* current bearing away the water poor in oxygen and laden with excretory products of digestion.

It is easy to conceive how a very much more complicated canal-system could have arisen if we imagine the ordinary cylindrical form to have sent out branches ; and these, in turn, to have also produced branches, giving rise to a colony of *Sycon* sponges. Further, if we imagine fusion to have taken place between contiguous branches and stem, and also a common envelope to have enclosed the branching cylinders, we have presented so intricate a circulatory system as almost to baffle interpretation—millions of inhalent pores and hundreds of exhalent openings, such as is familiar to us in the common bath sponge—*Euspongia*.

Before finally leaving the consideration of the canal-system one point of special interest may be mentioned and that is in connection with the flow of water from the flagellate chambers. In some forms (e.g., *Grantia labyrinthica*) the exhalent canals are furnished with minute diaphragms, working on the principle of the iris diaphragm. In sections, these are found with varying degrees of aperture showing that under special stimulus the so-called *muscle cells* which are closely connected with the diaphragms offer some kind of control in closing the apertures for the escape of water from the individual chambers, and so assist in regulating the current of water flowing through the sponge at large.

As a kind of working classification based on the canal-system of the calcareous group the following may be suggested because the sponges included in it are easy to obtain locally and are convenient to manipulate. But, as is well known, the canal-system alone cannot be relied upon to furnish a truly scientific classification, but it will serve a present purpose in affording a kind of focus in connection with which can be gathered the more important facts which have guided spongologists in adopting a more elaborate arrangement. The attention of those who wish for further information on the classification of this group is directed to the *Synopsis* drawn up by Professor Dendy and published in the "Proceedings of the Royal Society of Victoria," vol. v. (new series). Subjoined is a simple working classification alluded to above :—

CALCAREOUS GROUP.

Order I.—HOMOCÉLA, in which no flagellate chambers are present, but the collared cells are confined to the gastral cavity.

Exs. *Leucosolenia stolonifer*, *L. stipitata* and *L. pulcherrima*.

Order II.—HETEROCÉLA, in which the collared cells are confined to the flagellate chambers.

Family I.—The flagellate chambers project freely.

Ex. *Sycon raphanus*.

Family II.—The flagellate chambers are enclosed by a cortex.

(1.) With radiate arrangements of chambers.

Ex *Sycon gelatinosum*.

(2.) With chambers scattered irregularly.

Ex. *Vosmaeropsis macera*.

The names in the above list do not convey any idea of the shape and size of the specimens selected as examples, and it will be well, therefore, to state a few simple facts in regard to their external appearance and habits of growth as aids to discovery and identification, since one specimen gathered and identified is of more practical value than mere theoretical knowledge gained from twenty pages of a museum catalogue.

The first-named in the list is *Leucosolenia stolonifer*, and a more useful sponge can scarcely be found for our first study, because of its extreme simplicity of form and structure. We are fortunate in having so simple a sponge so close at home. It consists of a colony of three or four very thin walled tubes springing vertically from a slender rootlike bar of sponge tissue running horizontally along the surface of the weed to which the colony is attached by down-growing processes. Each tube reaches a height of about $1\frac{1}{2}$ inches, having a thickness of $\frac{1}{4}$ -inch. At the very top of the tube is the osculum for the outgoing stream of water. A thin section across one of the tubes shows an extremely thin wall pierced by pores which communicate directly, by means of narrow canals, with the central cavity which alone is lined by collared cells. The existence of the simplest possible canal-system and the absence of flagellate chambers render this sponge specially acceptable to a novice in spongology. There is little to learn about it, but this little must be learned before any real progress can be made with the anatomy of the more complicated forms. The sponge, unfortunately, is not of common occurrence, only one specimen, creamy white in colour, being captured during the visit; and that one was found attached to a piece of seaweed floating in with the incoming tide.

Closely allied, in relationship, to *L. stolonifer*, but differing entirely from it in appearance, is *L. stipitata*, found in considerable

numbers attached to the under surface of loose stones. Its somewhat oval body is fixed to the stone by a short slender stem—body and stem together measuring somewhat less than $\frac{1}{2}$ -inch. The sponge is built up of a complicated system of branching and anastomosing tubes, each of which is of the same type of structure as the simple tube of *L. stolonifer*. When viewed, under the lens, the wall is seen to be pierced with fairly large holes or *pseudopores*, and on the top ridge a single osculum usually occurs. The arrangement of the spicules which form the skeleton can be easily seen if the sponge is rendered transparent and mounted for microscopical examination.

A few examples of *L. pulcherrima* are also to be found living side by side with *L. stipitata* to which they are very similar in size and appearance.

In order to collect specimens of these small sponges the stone to which they are attached should be placed in water just deep enough to cover the surface of it. The sponges then take up a vertical position which allows them to be readily seen and removed.

Leaving the *Homocela* group we take for our next consideration *Sycon raphanus* which furnishes a higher type of canal-system than the examples we have already studied. The body of this sponge, pine-apple in shape, is perched on a short stalk which anchors it to the stone upon which it grows. In height it is usually less than $\frac{1}{2}$ -inch, and it occurs singly or in colonies (see Fig. A), each colony furnishing individuals in all stages of growth. Growing very close to the surface of the stone it is usually almost covered up with sand. This can be got rid of by removing the sponges to a small bottle of sea water or methylated spirit and gently shaking the same; successive changes to a fresh supply of water or spirit soon render the sponge fit for examination.

If a thin transverse section is examined it shows at once that the sponge owes its characteristic pine-apple appearance to the fact that the ends of the flagellate chambers which are developed as outgrowths from the central cavity project freely to the exterior and are protected externally by a special arrangement of one-rayed spicules which stand out like stiff spines. Each chamber is built upon the same plan as our simple type of sponge (*L. stolonifer*), but in place of a simple tube with its one exhalent opening, there are here hundreds of simple tubes, not leading an independent existence but all connected with and opening into one central cavity, which, in turn, opens to the exterior by one osculum. The water enters directly into the flagellate chambers by means of *prosopyles* which occur freely in the part of the wall exposed to the sea; then it flows through the chamber and so into the common central cavity, finally passing out of the sponge by the osculum at the top.

If sponges of this species are gathered in the summer, scores of embryos will be found embedded in the gelatinous material supporting the chambers or even in the chambers themselves, and anyone wishing to study the embryology of a sponge cannot do better than commence with *Sycon raphanus*. For this reason I have figured and described the various stages (see Plate I.) in the development of such a sponge, nearly all of which can be followed without much difficulty. The best methods to employ in such investigation can be obtained from text books which treat of special microscopic technique.

The next sponge on our list is *Sycon gelatinosum*, often known under the name given to it by Hæckel, as *S. arborea*. This is a very common species in Australia and is very variable in form, being either colonial or solitary. The solitary form, about an inch in height, is found attached to the under surface of stones; whilst the colonial form, which consists of tubes very richly branched, reaches a height of 2 or 3 inches and is found growing amongst the sea-grass on the ocean side of the reef at Flinders. In colour these sponges are a creamy white and in some a fringe of spicules surrounds the oscula whilst in others it is absent.

A single tube or branch of the colonial form represents a single individual of *S. raphanus* and if we examine a transverse section of such a tube we notice that the chambers have a radiate arrangement as in *S. raphanus* but the ends do not project freely as in that form but are enclosed in a cortex which is continuous from chamber to chamber. The presence of this cortex necessitates some change in the canal-system and we find special pore-areas in it through which the water enters. The pores lead into *inhalent canals* which communicate directly with the *prosopyles* in the walls of the flagellate chambers through which the water flows; the chambers open by means of very short *exhalent canals* in the *gastral cavity* and the stream of water passing out of each chamber is regulated by the opening and closing of a diaphragm with which each chamber is furnished.

The last example of the group to be considered is one named *Vosmaeropsis macera*. This sponge is something like *S. gelatinosum* in appearance, but the tubes are more densely agglomerated, the numerous individuals being almost completely fused together. We take this form for examination because of the modification of its canal-system as compared with the last example. Here the chambers are thimble-shaped, but they are scattered somewhat irregularly between the dermal cortex and the gastral cavity, and as they lie at some distance from the gastral cavity communication is effected by means of long exhalent canals, whilst in *S. gelatinosum* these canals are short.

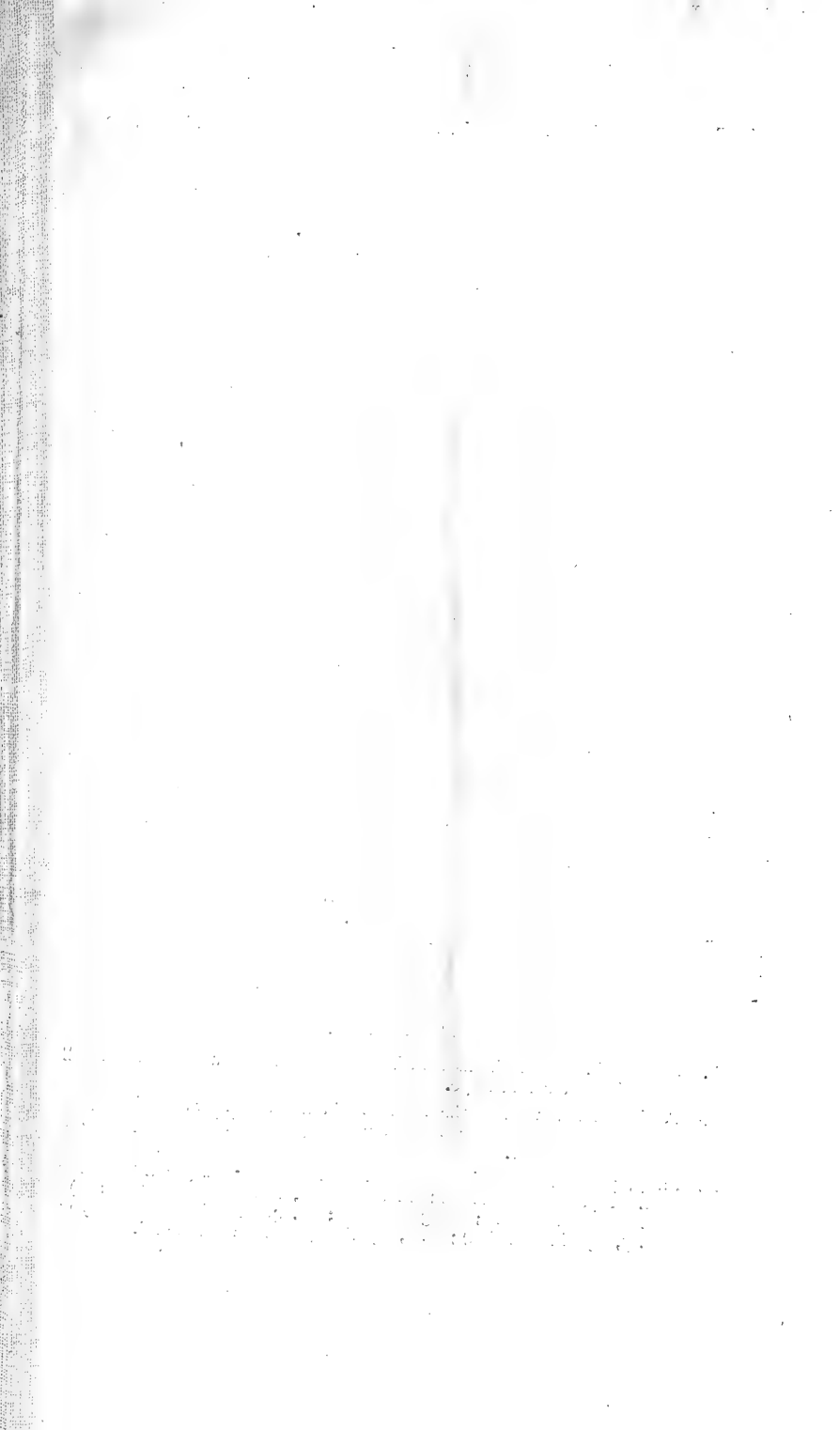
The calcareous sponges described above do not, of course, exhaust the list of the Flinders specimens. They have been

described in some detail because they show the development of the canal-system from the simple type of *L. stolonifer* to the more complex one of *V. macera*, and they show it in an unmistakable manner.

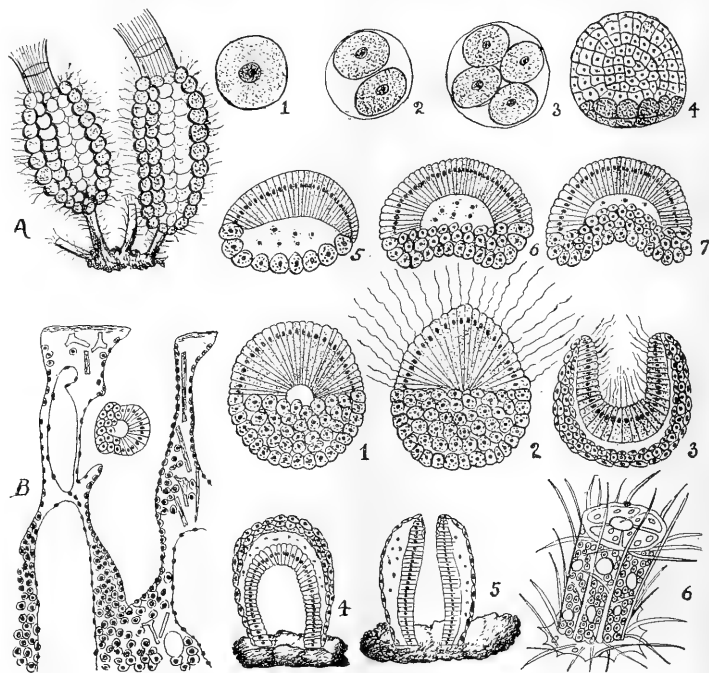
Reference has been made, again and again, to the presence of spicules. They lie in the mesodermal tissue of the sponge, each being developed from a single cell, the *scleroblast*, and are composed of carbonate of lime, and give strength, support and protection to the softer tissues. Three main forms can be distinguished :—The *triradiates*, which consist of three rays or arms radiating from a common centre ; the *quadriradiates* with four rays, the fourth ray projecting from the centre of the spicule in a plane at right angles to that of the other three ; and the *oxeotes* which consist of a simple rod usually spindle-shaped and pointed at both ends. Specimens of the various kinds of spicules can be obtained either by teasing up a piece of sponge with needles or by boiling sponge tissue with a little potash.

A few lines may be given here in reference to some interesting fossil forms of members of this group occurring at Flinders. About a mile westward of West Head, near the bathing boxes, a small cliff-section of limestone rock of Eocene age is within easy reach, where, mixed with fragments of polyzoa, echinoid tests and brachiopoda, several varieties of sponges occur. Examples of these were lately forwarded by Mr. T. S. Hall, M.A., one of the vice-presidents of this Club, to Dr. G. J. Hinde, F.R.S., who in the *Quart. Journ. Geol. Soc.*, vol. lvi., describes them as belonging to three new species. Two of them require new genera for their reception, namely, *Plectroninia* and *Tretocalia*, whilst a third form is referred to a genus, *Bactronella*, which occurs in rocks of Jurassic age in Europe. The state of preservation of this latter form enables Dr. Hinde to add to our knowledge of the genus. *Plectroninia* is interesting in that it belongs to the group of calcareous sponges with fused spicules which so far is known to contain only this genus and a recent Japanese form, the two together forming the group *Lithonina*. *Tretocalia* and, possibly, *Bactronella* seem to be *Pharetrones*, but better preserved specimens from clay beds are wanted to settle the point. The *Pharetrones* were supposed to have become extinct at the close of the Mesozoic period, but here we have some Tertiary ones, while Professor Dendy regards one of our recent Australian genera, *Lelapia*, as a living representative of the same group.

Further details as regards the anatomy of many of the local forms of calcareous sponges can be obtained from the articles by Professor Dendy published in the *Proceedings and Transactions of the Royal Society of Victoria* and the *Quarterly Journal of Microscopical Science*.



DEVELOPMENT OF A CALCAREOUS SPONGE.



TRIUMPH Engraving Co.

PLATE I.

- A.—Colony of *Sycon raphanus* showing two adult individuals and two small ones in the olynthus stage.
- B.—Portion of a section of the Sponge, *Grantia labyrinthica*, showing an embryo breaking loose from the embryo-containing cavity into a flagellate chamber.
- A. 1, 2, 3, 4.—Ovum in various stages of segmentation ; A. 5, blastosphere ; A. 6, 7, pseudo-gastrula ; B. and B. 1, blastosphere (late stage) ; B. 2, amphiblastula ; B. 3, gastrula ; B. 4, three-layered embryo ; B. 5, olynthus (section) ; B. 6, olynthus (external appearance).

We commenced with the question, Are sponges animals or plants? and our examination of the circulatory and digestive system indicates their animal status. But the most convincing evidence, placing them, without doubt, amongst the animals, comes from a study of their development. In this they are distinctly *holozoic*. That we may learn a few facts about the general principles of sponge development it will be well to take as a type, *Sycon raphanus*, because it is easily obtained, and, in the summer season, is usually well provided with embryos in every stage of development. The following stages may be noted:—

(1.) Reproductive cells are formed from cells in the mesoderm of the sponge and the reproductive elements—male and female—are fashioned from them. The male elements or spermatozoa are formed by the division of these reproductive cells into a large number of parts each of which develops a head and tail, whilst the female cells or ova become somewhat spherical in shape and are furnished with a large nucleus.

(2.) The ova of one sponge are probably fertilized by the spermatozoa from another and then commence to develop in the mesoderm of the mother sponge near the walls of the flagellate chambers.

(3.) Each ovum begins to divide in an orderly manner into 2, 4, and 8 parts, and so on—the cells at the upper pole being somewhat columnar in shape whilst those at the lower pole are spherical and granular. (Pl. I., A. 1, 2, 3, 4.)

(4.) A little later and these layers are clearly marked off from each other with a cavity between them and the *blastosphere* stage is reached. (Pl. I., A. 5.)

(5.) A little later and the granular cells become pushed in towards the columnar cells. This is probably due to the position in which the embryo is lying—the granular cells being bounded by spicules whilst the columnar cells are free to expand. This is known as the *pseudo-gastrula* stage. (Pl. I., A. 6, 7.)

(6.) About this time the embryo bursts through the wall of the flagellate chamber: the granular cells are pushed out again and the embryo has the form of a hollow sphere (Pl. I. B. and B. 1.) The columnar cells now produce cilia and the embryo, by their means, is free to move in the water. This is known as the *amphiblastula* stage. (Pl. I., B. 2.)

(7.) True invagination now takes place, the columnar cells being pushed in whilst the granular cells are arranged in a single layer outside and the segmentation cavity reduced to a mere slit. This is the *gastrula* stage. (Pl. I., B. 3.)

(8.) A little later and the embryo attaches itself by its open end to some foreign object. The outer granular cells become flattened, the columnar cells lose their cilia and a gelatinous layer is produced between the other layers. Three distinct layers are, therefore, now present—ectoderm and endoderm with a layer of mesoderm between. (Pl. I., B. 4.)

(9.) The next stage consists in the elongation of the embryo into a tubular form when it becomes flattened at the top and perforated by an osculum. The walls are pierced by pores, spicules appear in the gelatinous layer and the ciliated cells develop into collared cells. This is known as the *olynthus* stage. (Pl. I., B. 5, 6).

(10.) Special chambers are gradually budded out from the gastral cavity and the collared cells become restricted to these chambers, the gastral cavity being lined by a layer of flattened ectodermal cells.

SOME PECULIAR HABITS OF CRABS.

BY O. A. SAYCE.

(Read before the *Field Naturalists' Club of Victoria*, 9th July, 1900.)

APART from the structure of crabs, which is often very curious, their habits are frequently of striking interest, as for instance amongst the Oxyrrhyncha, or sharp-snouted crabs, many of them exhibit the peculiar habit of clothing themselves with foreign substances, such as pieces of sea-weed, hydroids, and such like, in imitation of their surroundings, and so mask themselves from their enemies and their prey.

A cursory view of one of these crabs would suggest the idea that the foreign material had grown on the animal, but this is not so, for over the body and legs there are series of strongly curved hooklets, and many records are published that explain how the pieces required are snipped off and fastened on to the animal's hooks. Perhaps one of the most interesting records is that of Mr. David Robertson, a reliable naturalist of Scotland, who found, according to Stebbing, that his specimens of *Hyas* were capable not only of dressing but of undressing themselves. Of the effectiveness of their disguises he had often had practical experience, when upon visiting his aquarium in the morning he was unable to find specimens which he had placed there overnight, and which he had at first thought must have escaped. Close inspection and the help of a magnifying glass, however, would always show that they were present, but that they had so decked themselves out with the vegetables and animals around them as to lose all invidious prominence. By transplanting into an environment of sponges some that had clothed themselves in bright-coloured algæ, he ascertained how accurately they knew their business, for they laboriously picked off the gay colours and stuck themselves over with fragments of sponges in their places.

We have several species in our waters that perform this peculiar habit, and I exhibit a few to-night which are clothed with foreign materials. One very fine and large species, which I

have not yet specifically determined, is rather commonly to be met with in dredging in Western Port on a weedy bottom; another of smaller size I have identified as *Chlorinoides coppingerii*, Haswell. It also is from Western Port, but prefers a shelly bottom, and is generally decked with small pieces of shells. An individual of this species I freed from most of its clothing and placed in a jar with some broken shells and weed in the boat, and after arriving home, on examination in the evening it was fully clothed as exhibited to-night.

In the Dromidæ, a widely separated family from the above, most of its members protect themselves by carrying on their backs such objects as an ascidian, a sponge, or a valve of a lamellibranch mollusc. These are held in position by the hind legs, which are placed subdorsally and specially modified to fulfil this function. The body is subglobular in shape and very robust, and it is astonishing how large and heavy the burden often is that they bear, but that they are thereby afforded effective concealment is very evident. Amongst several species shown to-night that were dredged in Western Port are two that may frequently be found—viz., *Dromia ciliata*, Henderson, and *D. australiensis*, Haswell, the latter so far only having been recorded from Port Denison and Port Jackson.

The habit of the "Hermit" Crabs is too well known to need any explanation. Three species are shown on the table, amongst which is the little *Eupagurus lacertosus*, var. *nana*, Henderson, which, according to Whitelegge's "Crustacea of the Trawling Expedition of H.M.C.S. *Thetis*," exists very plentifully near Sydney.

A METHOD OF PRESERVING CRUSTACEA.

BY O. A. SAYCE.

(Read before the Field Naturalists' Club of Victoria, 9th July, 1900.)

A METHOD of preserving small animals without the need of their being kept in a fluid, and yet to remain supple and of natural appearance, is a desideratum of importance. By this means, besides a saving of glass jars or containers, with alcohol or its equivalent, it allows of more ready handling and examining of specimens; and further, during a collecting excursion far from home it simplifies the packing of the material on return, as well as affording other benefits.

For animals of a soft structure, or those containing large fluid cavities, such as the Vertebrata, they would require the careful use of special hardening reagents and secondary treatment, and so far I know of no satisfactory method; but for forms with a firm outer skeleton like the Crustacea, and such as Star-fish and Sea Urchins, I have confidence in recommending the following

process as being eminently easy for all, inexpensive, requiring a minimum of trouble, and withal yielding satisfactory results in comparison to totally dried specimens.

The process is based upon the use of a substance having preservative properties and which will prevent the tissues of our specimens from suffering desiccation on prolonged exposure to the air. A substance of pre-eminent importance in this respect is glycerine.

It is, however, necessary to have the tissues rapidly infiltrated by a preservative before *post-mortem* changes take place, and glycerine alone is not suitable, on account of its relative high density; and also, when the specimens are withdrawn with a view to their partial drying, the hygroscopic property of the glycerine prevents this being practicable.

It should be borne in mind that glycerine is a powerful solvent of many substances. In dealing with delicate animals containing lime salts the glycerine to be used, or any mixture of it, may first be saturated with a little powdered bone or shells, but in practice I have not found this necessary.

The following mixture I have found to fulfil the more important requirements for Crustacea. It also will serve as a basis to work from for more difficult subjects; change in the proportion of glycerine, and also hardening treatment with a solution of such substances as chloride of zinc, alcohol, or formalin will be necessary in attempting these, either preliminary to or in conjunction with glycerine:—Glycerine, $1\frac{1}{2}$ parts; water, 1 part; methylated spirit, 1 part (each by volume); corrosive sublimate, 1 in 2,000.

Specimens may first be put into 70 per cent. alcohol for any length of time, or they may be placed directly into the mixture (preferably after having been well washed with fresh water to remove the salt), and after they have soaked sufficiently long to allow of all the tissues being penetrated by it, they may be taken out, set aside for a few days, during which time the spirit will have evaporated, and according to the condition of the atmosphere there will have been more or less evaporation of the water. The glycerine will, of course, remain in the tissues however dry the air may be, so that desiccation of the tissues need not be feared. The specimens now may be stored in suitable boxes, or wrapped in waterproof paper, but on account of the hygroscopic property of the glycerine, if the air in these boxes becomes very damp the surfaces of the specimens will become more or less wet, to again dry with change of atmospheric conditions, but by the use of the alcohol this has been minimized as far as possible. If important to prevent this irregular condition, it is necessary to coat the specimens with some suitable waterproof covering that will not become too brittle and be without any colour, also that will

not be acted upon by glycerine; and here I have had some difficulty in finding a suitable substance, but I can now recommend the following:—First apply one or more coatings of a warm, thin solution of gelatin, and, after its having dried, immerse the specimen for a few minutes in a solution of formalin, say of 10 per cent. strength, which will make the gelatin insoluble in water, and so the specimen will be rendered impervious to damp, and the glycerine consequently not subject to atmospheric changes.

By the above treatment all the articular membranes down to the minute mouth parts and antennæ will be found quite supple and capable of being turned aside, or dissected off, for examination. The varnishing necessarily makes them stiffer than if left without it. I submit for your inspection numerous examples treated by the above process, both unvarnished and varnished, including the soft-bodied Hermit Crabs, and examples of the Dromidæ with sponges and ascidians on their backs; also, incidentally, a few Sea-Urchins and Star-fish, including some Brittle Stars, which are quite mobile.

To make the process clear to all, I will now give detailed particulars for treatment of crustacean specimens:—

Take a wide-mouthed glass fruit-jar, known as the "Chicago," of a quart size, measure 8 ozs. of strong methylated spirit and dissolve 7 grains of corrosive sublimate (a violent poison) in it, then pour it into the jar and add 8 ozs. of water and 12 ozs. of glycerine, and shake the whole well together until the glycerine is thoroughly diluted. This now will act as our stock jar, and specimens may be immersed in it from time to time, but after some use it should be strained, and a little more glycerine, spirit, and sublimate added. It must be noted that a metal container must not be used for this mixture, or the corrosive sublimate will be reduced.

As regards the time of immersion, this will of course depend upon the size of the specimens, but they will not be injured if kept indefinitely in it. With the more bulky ones, such as the Fresh-water Crayfish, *Astacopsis bicarinatus*, and larger forms, a small hole should be drilled in the carapace over the region of the heart, and by a small glass syringe some of the mixture should be injected through into the blood space, and a few punctures made with the blade of a knife in the intersegmental membranes. Ten days' immersion will suffice for *Astacopsis*. For specimens of such a size as our common shore crab, *Paragrapsus gaimardi*, and larger forms, slit the membrane that unites the carapace to the reflexed abdomen (thoracico-abdominal membrane) on the upper surface from one side to the other, and place in the mixture for at least a week. Smaller forms may simply be placed directly into the mixture, but in all cases they should be cleaned from any dirt first, and preferably well rinsed with fresh

water. Also each specimen should have a paper label with particulars written on it with a black lead pencil (not ink) and tied to it before going into the jar. Such label should indicate exactly where found, and if dredged the depth and character of the bottom, also the colouration when alive, as many change colour after death. If any specimens are too large for the jar, such as the larger *Macrura*, they may be first dealt with by dividing the trunk from the abdomen and taking out and discarding the muscles and viscera.

When the specimens are taken out of the jar they should be drained from excess of moisture, and may then be at once packed for transit, or the moisture may be allowed to evaporate in a dry atmosphere for a few days or longer, and afterwards stored in suitable boxes, or they may be wrapped singly or in classified groups in waterproof paper (paraffin-waxed or oiled) with labels outside. If desired they may be coated with a colourless varnish in the manner previously explained.

Small specimens, such as the Amphipods, are best kept in bottles containing 70 per cent. alcohol, to make which add to strong methylated spirit a one-fourth proportion of water. They can, however, be treated by the glycerine process if necessary, as specimens here to-night show.

Formalin alone should not be used for Crustacea, for even in weak solutions it hardens the articular membranes so that they become too brittle for satisfactory dissection.

DESCRIPTION OF A NEW BIRD FROM NORTH-WEST AUSTRALIA.

BY ALFRED J. NORTH, C.M.Z.S.,

Ornithologist, Australian Museum, Sydney.

My friend, Mr. Kearthland, has forwarded me for examination and description a bird skin received by him from Mr. Tom Carter, of Point Cloates, North-west Australia, together with the following note :—"I shot two of these birds on barren, rocky ranges in the dense spinifex tufts." The specimen is labelled a female, and was obtained by Mr. Carter on the 1st July, 1899, at North-west Cape, near Exmouth Gulf, North-west Australia. It belongs to an entirely new genus and species, which I characterize as follows :—

ORDER PASSERES.

FAM. TIMELIIDÆ.

Sub-Fam. Timellinæ.

Group Bradypteri.

Eremiornis, gen. nov.

Generic characters.

Bill shorter than head, slender, as high as broad at nostril and tapering gradually to the tip ; rictal bristles weak, hardly visible ;

wings short and rounded, the first primary about half the length of the third ; tail longer than wing, the feathers graduated, broad and rounded at the tips, the central ones equal in breadth to the length of the tarsus ; upper and under tail coverts long, broad, the central upper tail coverts more than half the length of the longest tail feathers, and about equal in length to the outer tail feathers ; tarsi short, slender ; feet small, the middle toe with claw equal in length to the tarsus ; hind toe short, with claw equal in length to middle toe.

EREMIORNIS CARTERI, sp. n.

Adult.—Lores and a distinct eyebrow dull whitish ; forehead rufous, remainder of the upper surface brown tinged with rufous, becoming slightly more rufescent on the rump and upper tail coverts ; wings dark brown, the primaries narrowly edged with dull ashy-rufous, and the secondaries broadly margined on their outer webs with rufous ; lesser wing coverts like the back, the greater series fulvous-brown, with dark brown centres ; tail dark brown, the four outermost feathers on either side tipped with fulvous-brown ; ear coverts pale rufous-brown, with distinct white shaft streaks ; sides of the neck ashy-brown ; throat dull white, passing into buff on the fore-neck and chest ; centre of the breast and abdomen dull white, washed with buff and becoming darker on the sides of the body ; under tail coverts fulvous-brown, with a slight rufescent tinge, and crossed on their apical portion with a broad subterminal brown band, which decreases in extent and is almost lost on the smaller outermost feathers ; under wing coverts pale fulvous-brown ; bill fleshy-brown, basal half of the lower mandible whitish horn colour ; legs fleshy-brown, feet slightly darker. Total length of skin, 5.65 inches ; wing, 2.07 ; central tail feathers, 2.6 ; outer tail feathers, 1.6 ; central upper tail coverts, 1.5 ; bill from forehead, 0.42 ; depth of bill at nostril, 0.11 ; width of bill at nostril, 0.11 ; tarsus, 0.5 ; middle toe 0.4, with claw 0.5 ; hind toe 0.23, with claw 0.4.

Habitat.—North-west Cape, North-west Australia.

The slender bill, short tarsi, small feet, and abnormally long upper and under tail coverts, which conceal the greater portion of its long and broad tail feathers, will serve to distinguish it from any other Australian genus. The long tail, short and rounded wings, and habits would indicate its position as being nearest that group of birds frequenting sterile situations with a sparse and stunted vegetation, among which are included *Amytis*, *Hylacola*, and *Stipiturus*.

Specifically I have much pleasure in associating this bird with the name of its discoverer, an ardent collector and keen observer of bird life in that part of the continent. It will be known by the vernacular name of Carter's Desert-bird.

BOOK NOTICE.

THE INSECTIVOROUS BIRDS OF VICTORIA. By Robert Hall. Melbourne, 1900.

A USEFUL handbook to the insectivorous birds of Victoria, from the pen of Mr. Robert Hall, whose "Key to the Birds of Australia and Tasmania" was recently reviewed in these pages, has just been issued from the press. The volume extends to 260 pages, and is divided into five parts, as follows:—(1) Birds exclusively insectivorous, or mostly so, under which 69 species are grouped; (2) birds insectivorous and vermin-destroying, 7 species; (3) birds insectivorous and granivorous (beneficial), 7 species; (4) birds insectivorous and frugivorous (more or less useful), 8 species; and (5) birds offensive in certain seasons to fruit-growers and agriculturists, 4 species. The birds are arranged under the A. A. A. S. vernacular names, then follow the more commonly used local names (if any), the scientific name with its pronunciation and derivation—an excellent innovation in such a book. Reference is then made to the figure of the bird in Gould's "Birds of Australia," followed by the geographical distribution in Australia and a key to the species. General remarks on the habits or peculiarities of the birds, many of which are reprinted from these pages, are given, together with brief descriptions of the nests and eggs. Nearly every article is illustrated by a reduced figure of the bird or of its nest, or some other prominent feature. Altogether some sixty illustrations are included in the work, though many of them, being reproduced from Gould's plates, are somewhat indistinct, but sufficient perhaps to distinguish the birds. The rest of the illustrations are principally of nests, from photographs by the author, which have afforded some excellent half-tone engravings. A short glossary of technical terms, a diagrammatic figure of a quail with its various external parts named, and a map of the geographical sub-regions help to complete a work which should be of much value to the bird-lover as well as the more practical man who has to consider the good or bad qualities of the feathered life around him. On the final page is printed a key to the coloured charts of the insectivorous birds and their eggs in course of preparation by the Education Department for the use of the State schools, and we understand that the Department has arranged to take copies of the volume, so that it may be used in the schools as an explanatory handbook to these charts. This action is much to be commended, and we trust will tend to increase the knowledge of our bird-life throughout the colony.

EXCHANGE.—Wanted, colonial (and British) tokens. Will give British or Australian shells, books, or buy.—C. T. MUSSON, Hawkesbury Agricultural College, Richmond, N.S.W.

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❖ OBJECTS. ❖

THIS CLUB was founded in 1880 for the purpose of affording observers and lovers of Natural History regular and frequent opportunities for discussing those special subjects in which they are mutually interested; for the exhibition of Specimens; and for promoting Observations in the Field by means of Excursions to various collecting grounds around the Metropolis.

PRACTICAL EVENING.

MONDAY, 27TH AUGUST.

The second of the course of four, on Botany, by
Mr. H. T. TISDALL, dealing with—

Muscineae—Marchantia, Moss

Vascular Cryptogams—(Fern, the Common Bracken)

Members are requested to bring microscope, note book and drawing materials.

THE VICTORIAN NATURALIST

*Contains the proceedings of the Field Naturalists' Club
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MOST of the Numbers from the commencement, January, 1884, can be obtained from the Hon. Sec., Mr. Geo. Coghill, 80 Swanston Street, Melbourne, at Sixpence each, or in sets (except Vols. I and IV.), with title page and index, 6/- per volume.

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The Victorian Naturalist :

THE JOURNAL AND MAGAZINE

— OF —

The Field Naturalists' Club of Victoria.

PUBLISHED 6th SEPTEMBER, 1900.

Editor: F. G. A. BARNARD, Esq.

The Author of each article is responsible for the facts and opinions recorded.

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1900.

Field Naturalists' Club of Victoria.

ROOMS—ROYAL SOCIETY'S HALL, VICTORIA ST., MELBOURNE.

BUSINESS PAPER FOR MONTHLY MEETING.

Monday, 10th September, 1900, at Eight p.m.

1. Correspondence and Reports.

2. Election of Members.

	Proposer.	Second.
Mrs. and Mr. W. Thorn Hawthorn.	F. Pitcher	A. E. Kitson

3. Nominations for Membership.

Members making nominations will oblige by handing the full name and address to Hon. Secretary.

4. General Business.

5. Reading of Papers and Discussions thereon.

(Authors are requested to hand in a brief resume of their papers to the Secretary.)

1. By Mr. O. A. Sayce, "On Phreatoicus Australis, from Tasmania."
2. By Mr. T. S. Hart, M.A., "The Tufts of Lake Burrumbeet."
3. By Mr. T. S. Hart, M.A., "On a visit to Tower Hill, Koroit."
4. By Mr. Geo. Lyell, Jr., "A New Australian Butterfly" (*Xenica Tasmanica*).
5. By Mr. J. H. Gatliff, "Note on the type of *Thalotia dubia*—a shell described by T. Woods."
6. By Mr. F. M. Reader (per Geo. Coghill), "Contributions to Flora of Victoria No. 10—*A New Grass, Stipa eremophila*."

6. Reading of Natural History Notes.

Members who may note any unusual occurrence, or see anything of interest in Foreign or Colonial papers, are requested to inform the Secretary of the same that he may arrange for their bringing them before the meeting; such notes should, however, be brief.

7. Exhibition of Specimens and Conversazione.

Members exhibiting specimens are requested to furnish the Hon. Secretary with written particulars of their Exhibits for record in Minutes and *Naturalist*.

* EXCURSIONS. *

SATURDAY, 15TH SEPTEMBER.—Glen Huntly. Leader, Mr. H. Cummins. Meet at Prince's Bridge Station 2.25 p.m. train. Pond Life.

SATURDAY, 29TH SEPTEMBER.—Sydenham. Leaders, Messrs. T. S. Hall, M.A., and C. French, Jun. Meet at Spencer Street Station 12.15 p.m. train. Geology and Botany.

SATURDAY, 6TH OCTOBER.—Sandringham. Leaders, Messrs. J. G. Luehmann, F.L.S., and J. Shephard. Meet at Flinders Street Station 2 p.m. train. Botany and Pond Life.

THE

Victorian Naturalist.

VOL. XVII.—No. 5. SEPTEMBER 6, 1900.

No. 201.

FIELD NATURALISTS' CLUB OF VICTORIA.

THE ordinary monthly meeting of the Club was held in the Royal Society's Hall on Monday evening, 13th August, 1900. The president, Mr. J. Shephard, occupied the chair, and about 60 members and visitors were present.

REPORTS.

A report of the visit to the Zoological Gardens on Saturday, 14th July, was read by Mr. D. Le Souëf, C.M.Z.S., who stated that about thirty members attended and spent an interesting afternoon. Among the principal objects noticed were the nesting mound of the Scrub Turkey, *Talegallus lathamii*, from which several young birds had been hatched the previous season. Examples of both the common and Spotted Emus were noticed, as also young and adult Cassowaries. Four young Tasmanian Marsupial Wolves with their mother attracted attention, and the fine pair of Polar Bears were much admired.

The hon. librarian reported the receipt of the following donations to the library :—"The Insectivorous Birds of Victoria," by Robert Hall, from the author ; "Annual Report of Secretary for Mines, Victoria, for 1899," from the Department of Mines, Victoria ; "Fungus Diseases of Citrus Trees in Australia," by D. M'Alpine, Department of Agriculture, Victoria, from the author ; "Proceedings Royal Geographical Society of Australasia (Victorian Branch)," vol. xviii., part 1, 1900, from the Society ; "Mineral Resources of New South Wales," Nos. 6 and 7, from the Department of Mines, New South Wales ; "Records of the Australian Museum, Sydney," vol. iii., part 7, from the Museum Trustees ; *Hawkesbury (N.S.W.) Agricultural College Magazine*, Nos. 1-7, from the Director ; *Queensland Agricultural Journal*, June, 1900, from Department of Agriculture, Queensland ; "Missouri Botanical Garden Eleventh Annual Report," 1900, from the Director ; "Annual Report Field Columbian Museum, Chicago," 1897-8, from the Museum.

GENERAL BUSINESS.

The hon. secretary announced that Mr. Dudley Newport had been compelled to resign the office of assistant librarian and secretary, owing to his removal from town, and asked for some member to take up the position.

PAPERS READ.

1. By Mr. J. G. Luehmann, F.L.S., entitled "Notes on a New Species of Eucalypt from South Gippsland."

The author stated that he had recently received specimens of a eucalyptus from Mr. A. E. Kitson, F.G.S., who had noticed the trees when engaged on the geological survey in the neighbourhood of Korumburra. The tree had been noticed previously by Mr. A. W. Howitt, F.G.S., but had been regarded by the late Baron von Mueller as a form of *E. gunnii*; however, from the examination of the fresh specimens he considered it worthy of specific rank.

Messrs. F. Pitcher and C. French, F.L.S., discussed the paper, the latter stating that he believed the tree to be the one known in the Mordialloc district as the "Swamp Gum."

2. By Mr. D. M'Alpine, entitled "Notes on the Habits of the Myxomycete—*Diachæa elegans*, Fries."

The author gave some account of the occurrence of this fungus-like organism on the living leaves of plants at Armadale.

3. By Mr. C. C. Brittlebank, entitled "Notes on the Lower Silurian and Granite of the Upper Werribee."

The author described in detail the different geological sections exposed in the Werribee Gorge, about six miles above Bacchus Marsh. His remarks were illustrated by a fine series of 24 lime-light views from photographs taken by Mr. A. J. Campbell, and by a large scale geological map of the district, based on the results of his own field work.

Professor J. W. Gregory, D.Sc., congratulated the author on the results of his observations and the thoroughness of his work, which, he said, was of great importance; and the president took the opportunity of welcoming Dr. Gregory to his first club meeting.

4. By Mr. A. Campbell, jun., entitled "A Trip to the Richmond River District, part ii.—Butterflies and Birds."

The author referred to the principal butterflies seen, and gave many interesting details of the habits of the birds resident in the "Big Scrub." The paper was well illustrated with a series of lantern slides, giving a good idea of the vegetation, &c., of the district and of the nests of several of the more interesting birds.

NATURAL HISTORY NOTES.

Mr. C. French, jun., drew attention to the alarming spread of the introduced plant, *Romulea bulbocodium*, a native of Cape Colony, which is rapidly destroying the pasture land around Melbourne.

Mr. C. Walter forwarded a short note on the plant *Cyperus gunnii*, J. Hooker, as new for Victoria, recently found near Orbost, East Gippsland, by Mr. Ed. E. Pescott, in which he said that this plant had been regarded by the late Baron von Mueller as a variety of *C. lucidus*, R. Br. The latter is common all over

Australia, except Western Australia, while *C. gunnii* is found sparingly along the eastern side from Tasmania to Queensland; the difference between the two being that in *C. gunnii* the stems are less stout and the spikelets often very broad, in dense globular clusters in a compound or simple umbel.

* The president then took occasion to congratulate Professor Baldwin Spencer on his election as a Fellow of the Royal Society of London, an announcement which was received with applause. Professor Spencer, in thanking the members for their good wishes, referred to the assistance the Club and its members had been to him during his residence in Victoria, and trusted that their fellow-member, Dr. Gregory, would derive as much benefit from the co-operation of members as he had done.

EXHIBITS.

By Mr. C. C. Brittlebank.—Geological map in illustration of his paper.

By Mr. A. J. Campbell.—Western Magpies, *Gymnorhina dorsalis*, Camp., old and young, a pair of each; also a specimen of Carter's Desert-bird, *Eremiornis carteri*, recently described as new in *Victorian Naturalist*, vol. xvii., p. 78, by Mr. A. J. North, C.M.Z.S.

By Mr. C. French, F.L.S.—Longicorn beetles with flabellated antennæ—*Anatasis muelleri*, *A. frenchi*, and two other *Anatasis*, all new species; *Petalodes laminosus*, *Enneaphyllus rossi* (n. sp.), *E. ceneipennis*, *Rhipidocera australasica*, and *Piesarthrius marginellus*.

By Mr. C. French, jun.—Specimen of introduced plant, *Romulea bulbocodium*, in illustration of note.

By Mr. C. J. Gabriel.—Shells from Western Port—*Myadora ovata*, *M. brevis*, *Cardium tenuicostatum*, *C. pulchellum*, and *C. cygnorium*.

By Mr. Jas. A. Kershaw, for National Museum.—Yellow variety of Crimson-bellied Parrakeet, from Charlton, with two normal specimens for comparison.

By Mr. D. M'Alpine.—The Myxomycete, *Diachæa elegans*; fungus, *Amanita strobilaceus*, found at Myrning on 9th August.

By Mr. F. Pitcher.—Native axe from Box Hill.

By Mr. C. Walter.—*Cyperus gunnii*, J. Hooker, new for Victoria, from Orbost district, East Gippsland, and, for comparison, *C. lucidus*, R. Br., from same district; collector, Ed. E. Pescott.

After the usual conversazione the meeting terminated.

PUBLICATIONS RECEIVED.—*Science Gossip*, June, July, August, 1900; *Knowledge*, April, May, June, 1900.

A TRIP TO THE RICHMOND RIVER DISTRICT.

PART I.—GENERAL AND BOTANICAL.

BY A. CAMPBELL, JUN.

(Read before the Field Naturalists' Club of Victoria, 9th July, 1900.)

THE Richmond River is situated in the extreme north-east corner of New South Wales, its mouth being not more than 30 miles south of the Tweed, which forms part of the boundary between New South Wales and Queensland. From the Clarence River, which is still further south, to the Tweed is the district known to naturalists as being the southern limit of Australian tropical and semi-tropical vegetation and bird-life. The territory comprising the Clarence, the Richmond, and the Tweed River districts is a coastal region, and is subject to the tropical rainy season, setting in about the end of January. There is no great width of territory, for the Great Dividing Range is less than a hundred miles from the coast. Rivers flowing east, therefore, would be expected to be rapid and with a short course, but it is not so with the three under notice, for they wind about in the rich alluvial flats as broad streams navigable to coasting steamers for many miles of their courses. Notice particularly the Richmond: from the township of Lismore, which is situated inland at the junction of two creeks, the distance to the mouth by following the stream's course is quite 70 miles, whereas by taking the road it is only 22 miles. The two creeks, Wilson's and Leycester, coming in from the north and north-west respectively and uniting at Lismore, form a stream of about 60 yards in width, when it takes the name of the Richmond.

On the upper reaches of this river are the belts of tropical vegetation known as the "Big Scrub," which extend over to the Macpherson Range. It was during the months of December and January I visited these scrubs, and I have prepared a sketch of my trip in this paper. Leaving Melbourne by steamer on a Saturday afternoon (the 4th December, 1897), I reached Sydney on the Monday evening. The same night I had expected to tranship to a coasting steamer bound northward, but owing to unfavourable weather I found a vessel would not sail until the following Thursday. In the meantime I enjoyed the various sights of Sydney. One morning I went across to Manly and along the back beach to the Quarantine Ground, where I found the local little bird, *Origma rubricata*, or Rock-Warbler, at home. On the summit of the cliffs and among the heather and out-cropping sandstone rocks quite a number of these birds were twittering sweetly in the morning sun. They are very nimble little creatures, and run along the rocks and through the stunted vegetation with great swiftness. I was fortunate in securing a pair of birds, but could find no traces of nesting operations.

After leaving Sydney in the *Tomki*, a twin-screw steamer of 400 tons, we had a very rough time at sea, but by Saturday morning we were outside the Richmond Heads. The entrance to the river is protected from the sands by two long and massive stone breakwaters, but the bar sometimes silts up to a remarkable extent, and often the steamers are delayed through not being able to cross. The entrance, too, is very narrow, and a tug-boat is needed to keep our steamer's head in the right direction. One vessel, the *Lismore*, some years ago attempted to cross in rough weather, and was driven on shore a little to the north. Her remains are still seen on the sands. About a mile from the entrance is the town of Ballina, and we are now on a splendid sheet of water between mangrove-lined banks, for the Richmond here must be 500 yards in width. From Ballina the river takes a long sweep to the south, and after passing several beautiful islets, some in midstream, we stop to unload cargo at the Broadwater Sugar Mills. This establishment is the only one of its kind in the district, and to it is sent all the cane grown along the river. The cane is conveyed on barges, which are moored, until ready to be unloaded, under a large shed built over the water's edge. We passed several tugs coming down stream with as many as three and four of these cane-laden barges in tow.

Leaving Broadwater the river takes another great turn to the northward. Several townships have sprung up along the river's course; our steamer stops at each place unloading cargo, provisions, &c., receiving produce on the return trip to convey to Sydney. Habitations, each with its area planted in cane or maize, are scattered along both sides of the river. A steam launch is occasionally seen moving from one plantation to another, conveying goods to and from the larger wharves. One launch I noticed was fitted out as a general store, no doubt going its round once a week.

The township of Curaki is a place of some importance. It is situated at the junction of the two arms of the Richmond. One branch, called the Casino arm, goes away to the north-west past the town of Casino, while the other is the north arm, along which we steam towards Lismore. The river now is much narrower, and has a very winding course, so much so that every now and again our steamer has to slacken speed to round the sharp curves. The country on either side consists of rich alluvial flats, one time well timbered with gum trees, but now studded with plantations of cane, maize, and in some places arrowroot, while in the stretches used as pasture the dry rung timber is left standing. Making our way up stream, however, we pass an occasional patch of semi-tropical vegetation, the first reminder that we are nearing the "Big Scrub." Soon after coming in sight of the outskirts of Lismore we stop awhile at the wharf of the New South Wales

Butter Company, where some hundreds of empty butter boxes are unloaded. The factory is one of the largest, perhaps, in Australia, and the shipping companies undertake to carry back free of charge one new empty for every full butter box conveyed as cargo. The Lismore wharf is in the heart of the town, and being Sunday morning all was quiet as we proceeded to our berth. Exactly 24 hours had been occupied in traversing the distance of 70 miles from the mouth of the river.

Lismore is apparently a thriving town, prettily situated on undulating ground between the hills and the river. The newer portion has spread across the stream, and a railway has recently been opened to Byron Bay towards the Tweed River, a distance of some 40 miles. I expected to be met at Lismore by my friend Mr. W. T. Bailey, but there was no appearance of him, so the next morning, after making inquiries, I was directed to his place at Cowlong, about 10 miles distant, and set out on foot. It was a lovely morning. I took the main road to Ballina, which after leaving Lismore rises abruptly on to the crest of the hills, and thence for a considerable distance runs along the series of ridges forming the eastern watershed of Wilson's Creek. The outlook is really beautiful, and on a clear morning the Macpherson Range, terminating in Mount Danger, is distinctly visible beyond the undulating hills which intervene, while in the foreground is occasionally caught the gleam from the water of the river below. The road leads past splendid maize crops, while patches of arrow-root and bananas are seen around every habitation. The timber is still eucalyptus, with very little undergrowth. It is surprising to see what a hold the imported plant *Lantana* has got; by the roadside in places it is a compact barrier, and where it has been allowed a free hand the growth is well nigh impenetrable. When I had traversed about five miles I caught sight of a patch of darker green vegetation ahead, which proved to be another outlying clump of "Big Scrub," for after passing through it the road was again in forest country. It is remarkable to see how abruptly the two classes of vegetation meet. But I notice that the undergrowth is becoming denser and taller, and the myrtle tree is now seen among it. The gum trees also are finer and more vigorous looking, for they are now growing in the rich red soil which makes the "Big Scrub" territory so luxuriant. Before reaching Mr. Bailey's place I had passed from the gum tree, or forest country, as it is called, into the "Big Scrub" proper. Cowlong appears to be out of touch to a certain extent with civilization, for a telegram I had despatched from Sydney six days previously had not arrived. It came by post the following Wednesday. After bringing my baggage out from Lismore, I was comfortably installed through the generous hospitality of a neighbour, Mr. J. M'Lean.

The next day I was exploring the scrub, where I found things

of course very different to Victoria, and at first I did not feel at home with the prickly undergrowth and twining creepers which were everywhere in evidence. But that same day I was enabled to see such glorious birds as the Rifle and the Regent in their true home. The "Big Scrub" grows in a rich red soil, the main tract extending from Lismore on the south to the Macpherson Range on the north, and the whole of the country is a delightful series of hills and hollows, with creeks and watercourses in abundance. But the scrub is now falling fast before the selector's axe, and dairy cattle in great numbers are thriving upon the rich pastures which take its place. The scrub-clearing is necessarily very heavy work, for the vegetation is so dense and luxuriant. The cutting of the undergrowth and the tree-felling are usually done during the early winter months, and then about December or January, if a good fire is sent through, all except the larger logs are burnt. There is no anxiety about bush fires in this country; the scrub is so moist that even the fiercest of the clearing fires will not penetrate more than six or eight yards into the green vegetation. After clearing the land the next operation is to form the pasture, and while in this embryo state every care is taken to keep down undesirable grasses. A grass the farmers of the Richmond have found most valuable for dairy stock is *Paspalum dilitatum*, the seed of which is sown profusely. Some have a bed of this grass set apart for seed purposes alone.

Dairy farming is one of the foremost of the thriving industries of New South Wales. Certainly the Richmond district attests the fact, for herds of 75 and 100 milking cattle are not uncommon. Throughout the district are the necessary adjuncts to the industry, the separating stations or "creameries," which in their turn feed the central butter factory at Lismore. Good grass and therefore good feed for cattle are available all the year round. Really the dry season is in winter time, for the tropical rains coming about the end of January create a deluge for three months, while in the spring and early summer previous to the downfalls extremely heavy dews settle every night. I was unfortunate during my trip, for the rains came very early—on Christmas Day—and I was treated to four solid weeks of wet weather out of the seven I spent in the district. The tropical shower is no joke, for the water comes down in bulk, and after each is over the pasture, the scrub, the road, everything is water striving to get away, racing down the hillsides and along the depressions at tip-top speed, forming watercourses in places previously dry, and filling creeks, even the river itself, to overflowing. The showers, sometimes accompanied by thunder, follow one another in quick succession. All may look bright, with a few scudding clouds, when lo! up comes a black bank to deluge the face of the land. Each shower as it approaches makes a great noise and is heard

some distance off, especially when crossing a maize field, for the hard leaves resound as the rain clatters on them. Several times I ventured out with my gun, but only to be drenched and find water to wade through on the way back. If overtaken by a shower while in the scrub I could hear the rattle on the tree tops long before the drops reached me below. To prolong the agony greater drops continued to fall from the thick foliage long after the rain had ceased. Sometimes, however, there is a lull for a day or two, and at such times when the sun is shining the moist "muggy" heat is very discomforting. Perspiration rolls from one with the slightest exertion. But as soon as the sun goes down it becomes cool, and the nights are very pleasant.

With the advent of the rains all vegetation grows amazingly, weeds spring up in the plantations and threaten to choke any tender crop, the fruit of the plantains begins to ripen, and pine-apples and melons fill to bursting with moisture. The red soil is very sticky; no farm implement will keep clean when working, for the earth will adhere to anything. For this reason, too, the low-lying parts of unmetalled roads are very heavy; the soil in the wheel-tracks works up to the consistency of putty. One place is locally called the "Gluepot" during the rainy season.

Several introduced plants flourish wild in the district. In abandoned clearings the Ink-weed, *Phytolacca*, grows quickly. The Lantana, mentioned before, although chiefly along the roadside, has spread in places and robbed the farmer of his ground. Three other plants to be found in a wild state are of more service. The blackberry, the edible passion fruit, and the Cape gooseberry grow and fruit luxuriantly on the cleared ground. It is quite a treat on a warm day to come across a passion fruit vine growing over a log or trailing up among the second growth of scrub, and to enjoy its luscious fruit.

At Wollongbar, on the main road from Lismore to Ballina, the Government have established an experimental or "model" farm. Tropical and semi-tropical plants of any commercial value are grown. Date, banana, and plantain palms and the tea and coffee plants take their places in the collection. A pretty feature is a trellis of vines of the granadilla, one of the passion fruit family. Some varieties of fruit trees do well, Japanese plums and persimmons notably; lemons and guavas, peaches and grapes also thrive, but with the last-mentioned unless the fruit is gathered before the rains come it is useless, for with the excess of moisture the berries soon burst. The fruit of the American vine, *Isabella*, however, remains unharmed. Japanese plums thrive splendidly, but insect pests are more than a match for the grower. The dreaded Queensland Fruit Fly has got too firm a hold. Mr.

Bailey had about 10 acres of trees, and it was pitiful to see the fruit, and not a small percentage either, ruined by the pest. The insect is about the size of the common house fly, and is of a brownish colour. It is very nimble, and in the early morning can be seen running about the fruit, the female depositing an egg, or perhaps two eggs, under the skin. The fruits selected are the ones just ripening; the larvæ, hatching in a few hours, commence to eat through the flesh, and all the tissue near their tracks becomes discoloured and putrid in a very brief time. Fruit apparently sound may be picked from the tree one afternoon and next day is unfit for use. The fly is not found in plums only, for apples, pears, persimmons, bananas, and oranges are also within its tastes. But this is not the same fly causing damage in the oranges around Sydney. The southern insect is a smaller species, *Halterophora capitata*; the name of the larger is *Tephritis tryoni*. Notwithstanding its great scope of action the Queensland Fruit Fly is successfully resisted by one kind of plum, namely, the Golden Heart. There must be something in the fruit not to the liking of the pest, for of all the varieties of plums in Mr. Bailey's orchard this was left untouched. Another variety, the Kelsey, can be saved because of its aptitude, uncommon with plums, to ripen in storage. It can be picked when changing colour, and so the Fruit Fly is cheated of its spoil. Another very destructive insect pest is the small beetle, *Monolepta rosea*, called the Peach Ladybird. It moves about in swarms, and attacks both the leaves and the fruit, sucking the nourishment from the leaf and tunnelling into the fruit, which bears the appearance of having been perforated by a charge of shot.

The citrus trees are badly affected by two pests. In spring-time the fat green larvæ of the *Papilio anactus* denude the trees of their young leaves; and the large brown Orange Bug, *Oncoscelis subsiventris*, punctures the fruit, raising unsightly galls on the skin. These large bugs are very common and very disagreeable. When you approach a tree they make helter-skelter for cover, and, like an iguana, keep on the other side of the branch to which you are. The trees of the large yellow guava are stripped in places of leaves by the Case Moth, *Clania lewinii*.

I shall now endeavour to describe more fully what the "Big Scrub" vegetation consists of. There are no eucalypts, for the gum trees were left behind in the forest country, but their places are filled by trees even surpassing them in size. Splendid specimens of the Teak and Mountain Ash are to be seen towering with the Fig and Buoyong trees to some 150 feet or more. The soil is so fertile that these tremendous trees can live and thrive close to each other, while their branches, intertwining, serve as a roof and shade to protect the smaller plants beneath. The scrub may be divided under three heads. Firstly, there are the large trees.

Secondly, the shrubs and the smaller trees, which under the friendly shelter of the larger ones form quite a forest by themselves—a forest within a forest. Under the third head will be put the ground lilies and the creepers, which clothe the scrub floor with their luxuriance. Of the creepers the most plentiful is the palm *Calamus australis*, known as the Lawyer Cane, which is found growing over fallen logs and around the tree trunks and shrubs. The green vegetative part is well covered with spines and thorns, which make the scrub, in places where the Lawyer has become thickly matted together, impassable. Dozens of the tough wire-like canes spring from one root and travel for many yards in all directions before the green portion is reached. It is no uncommon thing for a single cane to measure 200 feet in length, its thickness being not more than $\frac{5}{16}$ of an inch, while the growing portion adds another 30 or 50 feet to the plant. The green stem is protected by a sheath covered with spines; the ribs of the leaf also are armed, while from each joint there springs a tendril some 2 or 3 feet long, armed its whole length with two rows of incurved thorns. This tendril, in the simplest manner possible, catches in your clothing or in your flesh. It is useless attempting to drag yourself free, for the flexible plant will be pulled down on you and more tendrils will hook on. If caught you must stop and free the tendrils one by one. It is by the aid of these appendages that the Lawyer Canes climb among the trees, from where it is sometimes seen hanging in festoons in mid-air. A species of *Tecoma* is also plentiful in the scrub, and is very beautiful when in flower. Its vines spread themselves among the branches of the trees, and the long pliant stems hang like a number of vegetable ropes to the ground, trailing about in fantastic shapes.

(To be continued.)

NOTE ON THE HABITS OF THE MYXOMYCETE— *DIACHÆA ELEGANS*, FRIES.

BY D. M'ALPINE, Government Vegetable Pathologist.

(Read before the Field Naturalists' Club of Victoria, 13th August, 1900.)

ON 24th April last Mr. C. French, jun., kindly sent me an interesting fungus obtained at Armadale by Mr. W. S. Spence, with the remark that the violets and other plants on which it occurred looked as if someone had spilt candle grease over them, and then the dark heads developed. I determined the fungus to be *Diachæa elegans*, Fr., having been recorded before for Victoria.

It was not, however, recorded for Australia by Lister in his "Monograph of the Mycetozoa," and I sent him a specimen,

remarking that it was found on the living leaves of grasses, violets, &c., although hitherto noted only on dead leaves.

Referring to this he replied :—"The plasmodium feeds on dead leaves, but when the time for fruiting arrives it leaves its feeding habitat and climbs on to the surrounding herbage or sticks, where the conditions are favourable to the ripening of the fruit, but it does not feed on the living leaves. The late Dr. Rex, of Philadelphia, gives so pleasing an account of this habit that I quote the passage : 'I recall an instance in which the plasmodium of *Diachæa leucopoda* (= *Diachæa elegans*) crept up a clump of blackberry stems to a foot in height, and thence upon the radiating threads of a spider's web suspended between them, where it matured its exquisite sporangia.' We have seen a growth in a damp wood where the plasmodium had crept up herbaceous stems to a height of about 2 feet from the dead leaves on which it had fed, and there formed a vast number of sporangia."

This crawling habit, of course, is not confined to this species. I remember a case where spent tan was used as a mulch and the so-called "flowers of tan" (*Fuligo septica*, Gmelin) had crept up the stems of herbaceous plants to the height of a foot or more, and the yellow plasmodium was very conspicuous. Such instances show the necessity for scientific caution and careful observation before determining the habits of these organisms, with their plant-like structure and their animal-like motions.

DESCRIPTION OF A NEW PARRAKEET FROM THE BURKE DISTRICT, NORTH QUEENSLAND.

By ALFRED J. NORTH, C.M.Z.S.,
Ornithologist, Australian Museum, Sydney.

ORDER PSITTACI.

FAM. CACATUIDÆ.

Sub-Fam. Platycercinæ.

Platycercus macgillivrayi, sp. nov.

Adult.—General colour above verditer-green, the feathers on the occiput, hind neck, and back tipped or broadly edged with green, and the centres of those on the lower back, rump, upper tail and central wing coverts distinctly shaded with yellow; primaries and primary coverts black, their outer webs deep blue, the apical half of the outer primaries edged with ashy-grey; inner secondaries and scapulars verditer-green shaded with yellow; outer series of the greater wing coverts pale blue; lesser wing coverts, like the back, margin of the shoulder, and under wing coverts, rich turquoise-blue; two central tail-feathers green, the next feather on either side green, passing into blue on the apical portion and bluish-white at the tip, the remainder deep blue at the base and gradually passing into bluish-white at the tip; cheeks and

a ring of feathers around the eye blue ; lower sides of the throat and neck verditer-green ; a collar on the nape and a broad band on the lower breast and abdomen clear rich yellow ; feathers on the chest, thighs, and the under tail coverts verditer-green with yellowish centres ; bill bluish horn colour, paler at the tip ; legs and feet blackish-brown. Total length of skin 13.5 inches, wing 6.4, tail 7.2, bill from forehead 0.8, tarsus 0.8.

Habitat.—From Cloncurry north to Normanton near the shore of the Gulf of Carpentaria, North Queensland.

Remarks.—Judging by the bill and feet it is apparently a very old bird, and by the abraded outer primary and some of the lateral tail-feathers, is hardly through the moult.

In general colour *P. macgillivrayi* resembles *P. occidentalis*, described by me from North-west Australia—Rec. Austr. Mus., vol. ii., p. 83 (1893)—but has the head almost uniform in colour with the upper parts, instead of blackish-brown as in that species. *P. barnardi*, its nearest ally on the eastern side of the continent, differs from *P. macgillivrayi* in having the forehead red in all stages of its plumage, from the nestling to the adult, although very much paler in the former and increasing in depth of colour with age ; in having only the anterior portion of the cheeks washed with blue, the yellow band on the abdomen narrower and more or less deeply tinged with orange, the lesser wing-coverts deep blue, and the back bluish-grey.

This species, which I have named after its discoverer, Mr. Alexander Sykes Macgillivray, was obtained by him at Leilavale station, on the Fullarton River, about 30 miles east of Cloncurry township, North Queensland. It will be known by the vernacular name of Macgillivray's Parrakeet. For an opportunity of describing it I am indebted to Dr. W. Macgillivray, of Hamilton, Victoria, who has at various times kindly sent me specimens for examination that were collected by his brother in the same district. With the above described specimen Dr. Macgillivray has sent me the following note :—"My brother states these birds are common about Cloncurry, and he has noted them to within a short distance of Normanton, near the shore of the Gulf of Carpentaria."

It is remarkable that the genus *Platycercus*, so well represented in the southern portion of the continent, has hitherto had only a single representative, *P. amathusiæ*, in the Gulf district—Ramsay, Tab. List Austr. Bds., p. 16 (1888). This species, too, must be extremely rare, for I can find no record of a single example being obtained there ; neither is there to be found a specimen from that district in the Australian Museum or Macleay Museum, or of any other species of *Platycercus*.

In vol. xx. of the "Catalogue of Birds in the British Museum," Count Salvadori has adopted Bonaparte's subdivision of the *Platycerci*, placing *P. barnardi*, *P. semitorquatus*, and *P. zonarius* in the genus *Barnardius*, in which, therefore, he would include my

P. occidentalis and the present species. I agree with Gould, however, that "such terms are objectionable when employed generically," and prefer, for the slight differences in external characters, not to separate these birds from *Platycercus*. Dr. P. L. Sclater, in a "List of the Vertebrated Animals in the Gardens of the Zoological Society of London," 9th edition, p. 363 (1896), also retains the abovementioned species in the genus *Platycercus*.

Relative to *P. barnardi*, both Dr. Ramsay, in his "Tabular List of Australian Birds," and Count Salvadori, in vol. xx. of the "Catalogue of Birds in the British Museum," omit Queensland from the geographical distribution of this species. I met with *P. barnardi* nesting in the Coolibah trees near the Queensland border in November, 1897, and saw young birds that were taken from the nesting-place in the hole of a tree in Queensland. Mr. Kendal Broadbent has also recorded it as common at Charleville, on the Warrego River, 520 miles west of Brisbane, and obtained a pair as far north as Barcaldine, in Central Queensland.

ADDITIONAL NOTE ON CARTER'S DESERT-BIRD, *EREMIORNIS CARTERI*, NORTH.

BY ALFRED J. NORTH, C.M.Z.S.,
Ornithologist, Australian Museum, Sydney.

Since the publication of my description of this species in the last issue, page 79, I have received through Mr. Kearthland the skin of a male obtained by Mr. Carter on the 2nd July, 1899, at North-west Cape, North-west Australia. It is apparently an older bird than the female procured by Mr. Carter the previous day in the same locality, and differs from the type by the absence of the long upper tail coverts, although the abnormally long under tail coverts are present as in the female. The upper parts are more strongly shaded with rufous, all the tail feathers are washed on their outer webs with rufous, and their tips are light rufous, the tips increasing in size towards the outermost feather, and gradually becoming paler; the centre of the lower breast and abdomen is washed with ochraceous-buff. Total length of skin 5.65 inches, wing 2.1, central tail feathers 2.6, bill from forehead 0.48, depth and width of bill at nostril 0.15, tarsus 0.52, middle toe 0.42, with claw 0.52, hind toe 0.25, with claw 0.42.

CORRESPONDENCE.

THE DISTRIBUTION OF AUSTRALIAN BIRDS.

To the Editor of the Victorian Naturalist.

SIR,—As I have for years taken a deep interest in the "distribution of Australian birds" and was unavoidably absent from the meeting of the Field Naturalists' Club held 9th April, 1900,

when Mr. Robert Hall read his paper on "Additional Records," as published in the *Victorian Naturalist*, vol. xvii., p. 59, I crave space for a few critical remarks thereon.

I have always lauded the good work done by Mr. Hall, therefore I think he will not take amiss the comments I offer now.

To commence with "Records for Area 3—Southern Queensland" (including Richmond and Clarence Rivers, New South Wales), and referring to *Sphæcotheres flaviventris* and *Pœcilodryas superciliosa*, Mr. S. W. Jackson previously kindly furnished me with these extensions for my long-delayed book. The former is correct; but the latter, judging by its nest and eggs (carefully compared with those of *P. superciliosa*), is *P. capito*, already recorded for the district. *Monarcha melanopsis* is in Gould's "Table of Distribution" (Handbook, ii., p. 587). *Manorhina melanophrys* is in the same "Table" (p. 591), while *Geocichla heinii* is recorded for Moreton Bay in the Cat. Birds Brit. Mus., v., p. 157, and for the Richmond and Clarence district in Seebohm's "Monograph of the *Turdidæ*."

I shall pass over Areas 6 and 8 and deal with "Area 9—Western Australia," at which I have been labouring for the last decade in ornithological matters with Mr. T. Carter, whose authority (in some instances by skins identified by me) Mr. Hall frequently quotes:—

Accipiter cirrhocephalus.—Original record, Gould's Handbook, ii., p. 585.

Sphenostoma cristatum.—Original record, Campbell, Roy. Soc. Vict., iii., p. 3 (1890).

Petrochelidon nigricans.—First recorded by Gould, not Ramsay.

Podargus strigoides.—Recorded by Hartert (Cat. Birds Brit. Mus., xvi., p. 631), not Le Souëf.

Calopsittacus novæ-hollandiæ.—Already recorded by Gould (ii., p. 593).

Turnix varia.—Gould records *T. scintillans* for the Abrolhos Islands. According to Cat. Birds Brit. Mus. (xxii., p. 551) *T. varia* and *T. scintillans* are synonymous.

Squatarola helvetica.—First recorded by Gould (ii., p. 594), not Ramsay.

Charadrius dominicus.—First recorded by Gould (*C. orientalis*, ii., p. 594), not Carter.

Ochthodromus bicinctus.—First recorded by Gould, not Ramsay.

Calidris arenaria.—First recorded by Campbell, Roy. Soc. Vict., vii., p. 201 (1895).

Demigretta sacra and *Nycticorax caledonicus* have both been previously recorded by Gould (ii., p. 595).

Phaeton rubricauda.—First recorded by Campbell, Proc. Aust. Ass., ii., p. 496 (1890).

Podicipes novæ-hollandiæ.—First recorded by Keartland, Proc. Roy. Soc., S.A., xxii., p. 191 (1898).

Carphibis spinicollis and *Plegadis falcinellus* have also been previously recorded, but I cannot place my hand on the precise reference at present.—I am, &c.,

ARCHD. J. CAMPBELL.

Armadale, 15th August, 1900.

BOOK NOTICES.

FUNGUS DISEASES OF CITRUS TREES IN AUSTRALIA, AND THEIR TREATMENT. By D. M'Alpine, Vegetable Pathologist to the Department of Agriculture. Victoria, Melbourne, 1899.

THIS work has recently been issued by the Victorian Department of Agriculture, and will doubtless be of great value to that section of our fruit-growers who devote themselves to the culture of the citrus family, such as oranges, lemons, &c. Some nine of the principal diseases are illustrated by means of twelve coloured plates executed by Mr. C. C. Brittlebank, and fully described, with symptoms, effects, causes, and treatment, &c. Then follow technical descriptions of some eighty fungi which affect the fruit, leaves, stems, or roots of the citrus family. A glossary of terms used is given, also an index of distribution, with an index of the common or scientific names, and finally nineteen plates containing 186 figures of the different features of the various fungi, mostly from drawings made with the aid of the microscope. The author is to be complimented upon the result of his study of these obscure forms of vegetable life, which we trust will be appreciated by those for whose benefit it has been prepared, and the artist and printer upon the natural appearance of the coloured plates.

MONTHLY PROGRESS REPORT, GEOLOGICAL SURVEY OF VICTORIA (NEW SERIES).—It is to be hoped that all the information contained in these apparently excellent reports is not of equal value with some of that given in the February number (No. 11) recently issued. This contains an article entitled "Notes on a Collection of Algæ, Polyzoa, and Hydrozoa from San Remo (Western Port)," by James Stirling, Government Geologist, in which is given a list of Algæ collected by Miss A. L. Stirling, and identified by the late J. Bracebridge Wilson, M.A., of Geelong. The list comprises forty-four species, four of which do not occur in the list of Victorian seaweeds published by Mr. H. T. Tisdall in the "Proceedings of the A. A. S. (Sydney Session)," 1898. Of the remainder the names of only eleven species are spelled correctly, while of the remaining twenty-nine species in some cases both the generic and specific names are incorrectly spelled, besides which a Coralline

is placed under Hydrozoa. Surely these cannot all be printers' errors.

WEST AUSTRALIAN SCIENCE.—The appearance of the eleventh issue of the Year-Book of Western Australia will be well received by all interested in science, for it contains articles far above the average for such publications, both in quantity and quality, most of the articles having the advantage of being written by those who knew what they were talking about, and not by mere compilers. Amongst those of special interest to us is an account of the fauna by Mr. B. H. Woodward, which gives a list of the mammals and birds, and a brief sketch of the other groups. The flora is treated by our old member, Dr. A. Morrison, while Mr. A. M. Lea discusses the insects. Geology falls to the lot of Mr. A. Gibb Maitland, and articles on History, Exploration, Aborigines, Minerals, Geography, Forest Resources, Fisheries, together with maps and illustrations—which latter, alas ! are mostly bad—furnish a volume which most of our members will find of interest and value.

ROMULEA BULBOCODIUM, Seb.—This plant, which is an introduction from Cape Colony, has become a troublesome weed, destroying pasture lands in Victoria, principally near Melbourne. It belongs to the order Irideæ, and spreads at an alarming rate, killing out the native and introduced grasses. A few years ago a small patch of this weed or bulb was noticed in the Richmond Park, where it has now spread to such an extent that the whole park is covered with it, while the parks adjoining the Melbourne, Richmond, and Scotch College cricket grounds are overrun with it. I am informed that it is also growing at Murrumbidgee, Oakleigh, &c., destroying the grazing paddocks there. Birds have been noticed feeding on the seeds, thus disseminating this pest in all directions.—C. FRENCH, jun.

[The plant, which may be known by its short-stalked pink flowers, almost hidden in its grass-like leaves, is now in bloom, and is very common both at Essendon and Kew ; in the latter suburb it was noticed at least ten years ago.—ED. *Vict Nat.*]

“HARD-SAT” EGGS—A SUGGESTION.—A correspondent in a recent *Zoologist* suggests that the difficulty sometimes experienced by oologists in having to deal with “hard-sat” eggs because fresh ones are not available might be overcome by treating them as small mammals or birds are often done to obtain their skeletons—viz., by placing them within reach of an ants' nest, and allowing those industrious insects to remove the contents. Of course, a hole must be drilled in the egg, but it would doubtless be much smaller than the one ordinarily required to remove the “hard-sat” contents. The method might be worthy of trial and report by some of our oologists.

Field Naturalists' Club of Victoria.

* OFFICE-BEARERS, 1900-1901. *

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* OBJECTS. *

THIS CLUB was founded in 1880 for the purpose of affording observers and lovers of Natural History regular and frequent opportunities for discussing those special subjects in which they are mutually interested; for the exhibition of Specimens; and for promoting Observations in the Field by means of Excursions to various collecting grounds around the Metropolis.

Exhibition of Wild Flowers, 8th October.

Annual Picnic at Blackburn, 27th October.

PRACTICAL EVENING.

MONDAY, 24TH SEPTEMBER.

The third of Mr. H. T. TISDALL'S, course, dealing with—

Gymnosperm—Pinus

Angiosperm—Monocotyledon (Grass or Lily)

THE VICTORIAN NATURALIST

Contains the proceedings of the Field Naturalists' Club of Victoria.

Authors of Papers published in the *Victorian Naturalist* are informed that reprints of such articles can be obtained at a nominal cost by giving notice previous to publication to the Hon. Sec., from whom all information can be obtained.

MOST of the Numbers from the commencement, January, 1884, can be obtained from the Hon. Sec., Mr. Geo. Coghill, 80 Swanston Street, Melbourne, at Sixpence each, or in sets (except Vols. I. and IV.), with title page and index, 6/- per volume.

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VOL. XVII.—No. 6.

OCTOBER, 1900.

The Victorian Naturalist :

THE JOURNAL AND MAGAZINE

— OF —

The Field Naturalists' Club of Victoria.

PUBLISHED 4th OCTOBER, 1900.

Editor : F. G. A. BARNARD, Esq.

The Author of each article is responsible for the facts and opinions recorded.

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1900.

Field Naturalists' Club of Victoria.

ROOMS—ROYAL SOCIETY'S HALL, VICTORIA ST., MELBOURNE.

BUSINESS PAPER FOR SPECIAL AND MONTHLY MEETING.

Monday, 8th October, 1900, at Eight p.m.

1. Correspondence and Reports.
2. Election of Members.

	Proposer.	Second.
Mr. F. E. Grant	O. A. Sayce ..	T. S. Hall, M.A.
Union Bank, Collins Street.		
Mr. W. S. Fulton	O. A. Sayce ..	T. S. Hall, M.A.
Exchange, Collins Street.		

3. Nominations for Membership.

Members making nominations will oblige by handing the full name and address to Hon. Secretary.

4. SPECIAL BUSINESS.

Motion by Mr. J. H. Gatliff for alteration of the Club rules:

- (a) That Clause B of Rule 4 be added to by the insertion, after the words "journal monthly," of the following:—

"Persons residing at a distance beyond a radius of fifteen miles from Melbourne shall be eligible as Country Members at an Annual Subscription of ten shillings, with the same privileges as ordinary members.

- (b) That Rule 10 be altered by substituting for the words "two Secretaries," "Secretary and Assistant Secretary."

To (a) Mr. Mr. T. S. Hall will move that the following be added:—

"Country Members may have books forwarded to them by post on payment of postage"

5. General Business.

Election of Assistant Secretary and Assistant Librarian.

	Proposer.	Second.
Mr. W. J. M'Caw	O. A. Sayce ..	T. S. Hall, M.A.

6. Reading of Papers and Discussions thereon.

(Authors are requested to hand in a brief resume of their papers to the Secretary.)

1. By Mr. H. T. Tisdall, "Remarks on the Orchids now in bloom."
2. By Mr. F. M. Reader, "Plants naturalized in Victoria since 1893."
3. By Mr. G. A. Keartland, "On the Collared Plain Wanderer."

7. Reading of Natural History Notes.

Members who may note any unusual occurrence, or see anything of interest in Foreign or Colonial papers, are requested to inform the Secretary of the same that he may arrange for their bringing them before the meeting; such notes should, however, be brief.

8. Exhibition of Specimens and Conversazione.

Members exhibiting specimens are requested to furnish the Hon. Secretary with written particulars of their Exhibits for record in Minutes and *Naturalist*.

* EXCURSIONS. *

Saturday, 6th October.—Sandringham. Leaders, Messrs. J. G. Luehmann, F.L.S., and J. Shephard. Meet at Flinders St. Station, 2 p.m. train. Botany and Pond Life.

Saturday, 20th October.—Bayswater. Under the leadership of Messrs. J. A. Kershaw, F.E.S., and G. A. Keartland. Meet at Prince's Bridge Station, 1.35 p.m. Ornithology and Entomology.

Saturday, 3rd November.—An extra excursion to You Yangs, under leadership Mr. T. S. Hall, M.A. Meet Spencer St. Station, 10.55 a.m. train. Geology and General.

Tuesday, 6th November.—Frankston. Under Mr. C. French, F.L.S. 8.40 a.m. Botany and Entomology.

Saturday, 17th November.—Black Rock. Messrs. J. H. Gatliff and H. T. Tisdall. Flinders St. Station, 2 p.m. Shells and Seaweeds.

THE
Victorian Naturalist.

VOL. XVII.—No. 6. OCTOBER 4, 1900.

No. 202.

FIELD NATURALISTS' CLUB OF VICTORIA.

THE ordinary monthly meeting of the Club was held in the Royal Society's Hall on Monday evening, 10th September, 1900. The president, Mr. J. Shephard, occupied the chair, and about 40 members and visitors were present.

REPORTS.

A report of the excursion to Heidelberg on Saturday, 25th August, was read by the leaders, Messrs. H. T. Tisdall and J. Stickland, the former dealing with the botany, and the latter with the pond life observed. Mr. Tisdall stated that with the exception of the Silver Wattle, *Acacia dealbata*, wild flowers were scarce, but a number of interesting water-plants, fungi, and mosses were noted or collected; while Mr. Stickland stated that a number of specimens illustrating pond life were secured, but proved to be all of fairly common species, but among which may be mentioned specimens of *Hydra viridis*.

An account of the visit to the Botanic Gardens on Saturday, 1st September, was given by the leader, Mr. F. Pitcher, who reported a good attendance of members. An interesting afternoon, which appeared much too short, was spent in inspecting the contents of the Economic Museum, the Systematic Collection, and the propagating houses; also the collection of water-plants, many of the latter being especially interesting. On the motion of Messrs. Pitcher and Barnard, a vote of thanks was accorded to the director, Mr. W. R. Guilfoyle, F.L.S., for his kindness in allowing the Club to visit privileged portions of the gardens.

The hon. librarian reported the receipt of the following donations to the library:—"Monthly Progress Report, Geological Survey of Victoria"—No. 11, February, No. 12, March—from Department of Mines, Victoria; "Proceedings Linnean Society of New South Wales," vol. xxv., part 1, from the Society; "Journal and Proceedings of the Royal Society of New South Wales, vol. xxxiii., 1899, from the Society; "Mineral Resources of New South Wales," No. 8, and "Records of Geological Survey of N.S.W.," vol. vi., part 4, 1900, from the Department of Mines, Sydney; Reprints of Papers by W. W. Froggatt, Government Entomologist, in the *Agricultural Gazette* of New South Wales, from the author; "The Queensland Flora," part 2, by F. M. Bailey, F.L.S., Government Botanist, from the

author; *Queensland Agricultural Journal*, July and August, 1900, from the Department of Agriculture, Brisbane; "Transactions of Royal Society of South Australia, vol. xxiv., part 1, and "Memoirs of Royal Society of South Australia," vol. i., part 2 (Fossil Remains of Lake Callabonna), from the Society; "Proceedings Royal Society of Tasmania," 1898-9, from the Society; "Journal of Mueller Botanic Society, Western Australia," 2 parts, from the society; *Hawkesbury Agricultural College Magazine*, vol. ii., part 3, from the Director; *Nature Notes*, July and August, from the Selborne Society, London.

ELECTION OF MEMBERS.

On a ballot being taken, Mr. and Mrs. W. Thorn, Findon-street, Hawthorn, were elected members of the Club.

GENERAL BUSINESS.

On the motion of Mr. J. H. Gatliff it was decided that a special meeting be held on the night of the next ordinary meeting to consider the following alterations in the rules:—"That after the words 'journal monthly' in clause b of rule 4 the following words be added, 'Persons residing beyond a radius of fifteen miles from Melbourne shall be deemed country members, and pay an annual subscription of ten shillings per annum, and shall have the same privileges as ordinary members.'"

Mr. T. S. Hall, M.A., gave notice that he would move—"That country members may obtain books from the library on payment of carriage or postage both ways."

Mr. J. H. Gatliff gave notice that he would move—"That the words 'secretary and assistant secretary and librarian' be substituted for 'two secretaries' in rule 10."

NOMINATION FOR OFFICE-BEARER.

Mr. W. J. M'Caw was nominated for the position of assistant secretary and librarian, rendered vacant by the resignation of Mr. D. Newport.

PAPERS READ.

1. By Mr. O. A. Sayce, entitled "On the Crustacean, *Phreatoicus australis*, from Tasmania."

The author recorded the occurrence of the Isopod, *Phreatoicus australis*, Chilton, among some crustaceans collected by Professor Spencer, F.R.S., at Lake Petrach, Tasmania, and gave a brief review of the genus *Phreatoicus*.

Mr. T. S. Hall, M.A., said that he hoped any member who had an opportunity of filtering water from deep alluvial mines would do so, as some mines were said to contain "shrimp

ground," indicating that the drainage would probably contain these lower forms of crustaceans.

2. By Mr. T. S. Hart, M.A., B.Sc., entitled "Notes on a Visit to Tower Hill, Koroit."

The author described the characteristic features of the extinct volcano of Tower Hill, with its surrounding lake, which he considered should be regarded rather as an "explosion" lake than a crater lake, and exhibited a map and photographs in illustration of his paper.

3. By Mr. T. S. Hart, M.A., B.Sc., entitled "The Tuffs of Lake Burrumbeet."

The author described the rock sections exposed in the cliffs surrounding the north-western portion of Lake Burrumbeet, in the Ballarat district. The cliffs consist of volcanic material, imbedded in which are numerous granite blocks, ejected from a vent or vents, probably now covered by a portion of the lake. The paper was well illustrated with maps, photographs, and rock specimens.

In the absence of the author these two papers were taken as read, a brief *résumé* of the contents being given by Mr. T. S. Hall, M.A.

4. By Mr. G. Lyell, jun., entitled "Description of a New Australian Butterfly, *Xenica tasmanica*."

The author described a butterfly from Tasmania belonging to the genus *Xenica*, which he named *X. tasmanica*. It approaches most closely to *X. hobartia*, Westwood, but is much darker. The specimens were taken at Strahan, on the West Coast.

5. By Mr. J. H. Gatliff, entitled "Note on the Type of *Thalotia dubia*, a Shell described by Tenison-Woods."

The author stated that he had carefully examined the type specimen of *Thalotia dubia* in the National Museum, Melbourne, and from comparison with a large series of specimens of *T. conica*, Gray, he was convinced that it was only an abnormal form of that species, and that *T. dubia* must therefore rank as a synonym of *T. conica*.

6. By Mr. F. M. Reader, F.R.H.S. (communicated by Mr. G. Coghill), entitled "Contributions to the Flora of Victoria," part x.

This was a description of a new grass from the Wimmera district, N.W. Victoria, and named by the author *Stipa eremophila*.

7. By Mr. F. M. Reader, F.R.H.S. (communicated by Mr. G. Coghill), entitled "Contributions to the Flora of Victoria," part xi.

In this paper the author described some well-defined varieties of grasses of species belonging to the genus *Stipa* which had come under his notice during several years' collecting in the Wimmera District.

NATURAL HISTORY NOTE.

Mr. F. G. A. Barnard called attention to the introduction into Victorian waters of the American plant, *Pontederia speciosa*, Kunth, known as the Water Hyacinth, and quoted from the *Queensland Agricultural Journal* for August as to what a pest it had become in that colony, as also the Yellow Water-Lily, *Nymphæa flava*, Leith, also of American origin. He exhibited specimens of the plant, and in view of the rapid manner in which it increases, cautioned members against introducing it into any Victorian lagoons or rivers.

Messrs. Coles, Sayce, T. S. Hall, Tisdall, Pitcher, Maplestone, and others joined in the discussion which followed, and the secretary was instructed to write to the Secretary for Agriculture, drawing his attention to the spread of the plant, which was reported to be already acclimatized in the Murray, and also to the spread of the Iris, *Romulea bulbocodium*, exhibited by Mr. C. French, jun., at the last meeting.

EXHIBITS.

By Mr. F. G. A. Barnard.—Orchid, *Pterostylis nutans*, and shrub, *Lhotzkya genetylloides*, from Grampians, both grown at Kew; some Western Australian wild flowers; and plants of Water Hyacinth, in illustration of note. By Mr. A. Coles.—Young Australian Blue Crane, *Antigone australasiana*, Gld. By Mr. C. J. Gabriel.—Shells, *Pinna australis*, from Western Port, and *Trigonia lamarchi*, from Sydney Harbour. By Mr. J. H. Gatliff.—Type shell of *Thalotia dubia* of Tenison-Woods, by permission of the Director of the National Museum; specimens of *Thalotia conica*, Gray, from Victoria, Tasmania, and South Australia, for comparison. By Mr. T. S. Hart, M.A.—Geological specimens, maps, and photographs, in illustration of his papers. By Mr. Geo. Lyell, jun.—Butterflies of the genus *Xenica*, in illustration of his paper, including the following species:—*X. tasmanica*, *X. achanta*, *X. klugii*, *X. hobartia*, *X. hobartia*, var. *lathoniella*, *X. orichora*, *X. kershawi*, *X. correae*, *X. correae*, var. *fulva*, and *X. leprea*. By Mr. F. M. Reader.—Dried specimens of grass, *Stipa eremophila*, new to science, and the grass *Amphipogon strictus*, R. Br., var. *setifer*, Benth., new for Victoria; also of varieties of grasses, *Stipa pubescens*, *S. aristiglumis*, and *S. scabra*, in illustration of paper. By Mr. O. A. Sayce.—Representative genera of the family Phreatoicidæ. By Mr. J. Stickland.—Green Hydras, from Heidelberg. By Mr. C. Walter.—*Pterostylis concinna*, from banks of the Snowy River at Orbost, East Gippsland, previously recorded in Victoria from Port Phillip coast only; *Diuris palustris*, Lindley, from Keilor Plains, September, 1900; *Dodonæa stenozyga*, F. v. M., from between Lakes Hindmarsh and Albacutya, September, 1900.

After the usual conversazione the meeting terminated.

FIELD NOTES ON THE GREAT SKUA GULL.

BY ROBERT HALL.

(Read before the Field Naturalists' Club of Victoria, 11th June, 1900.)

SKUA Gulls are of more than ordinary interest at the present moment, as ornithologist and oologist are bent upon knowing more than is available. Oologists are anxious to know if the smaller species breed in the Southern Hemisphere. The eggs in various collections are those that have been received from Norway or other northern lands. Professor Newton is of opinion that the two small ones on our list, *Stercorarius crepidatus*, Banks, and *S. pomatorhinus*, Brisson, have their stronghold in the northern hemisphere, and pass into the southern for the winter, e.g., become to us as summer residents, while Mr. Howard Saunders considers Richardson's Skua, *S. crepidatus*, an all the year round bird in the south as in the north.

The nomenclature of the smaller species is a bewildering puzzle. That certain specimens stay in the southern hemisphere while the same species is breeding in the northern is certain, as I have seen both phases of one or other *Stercorarius* in Port Phillip Bay in March, and late enough to lead me to believe they would not summer in the northern breeding-grounds. Where they (*Stercorarius*) breed in the south is not generally known, if known at all.

The range of *Megalestris antarctica*, Lesson, the Great Skua, is from the Shetland Islands past Kerguelen's Land to New Zealand, and sparingly between the Cape of Good Hope, Ceylon, and Southern Australia. It is a bold and strong bird, capable of long flights (1,100 miles from land). By a singular parasitic habit it lives by frightening other birds into disgorging portions of their partially digested food. By means of this habit it lives for nine months—that is, until the nesting desire takes it to land. It then captures prey for itself by fair, or probably by foul, means—in the first case, for example, by capturing rabbits, and in the second by taking eggs from nests when the birds leave them for a few moments.

My experience of the species led me to consider it a island substitute for a mainland hawk, acting in much the same way. For the first week on Kerguelen Island I could only realize the bird as one of prey, and not a web-footed species, especially as it builds its nest away from the beach and appears warlike. Rabbits and petrels are typical examples of their prey; less so cormorants. I was interested in seeing one above the entrance to a rabbit's burrow waiting for the animal to come out. The entrails, and I think the eyes, alone appeared to be taken out of the carcasses I observed lying about. The eggs, measuring 2.5 inches x 1.5 inches, were swallowed whole after being slightly cracked.

In Patagonia rodents, I venture to conclude, form their principal food, as this section of land animals is more numerous than any other. On Kerguelen Island small birds suffer heavily in the absence of small mammals. The arrival of a sealing ship at Kerguelen Island is an event for the bloodthirsty Skua and its dainty ally the gull, *Larus dominicanus*, Licht. They are the principal performers in the carcass-eating which follows a raid upon a seal-lair. Giant Petrels rush into the skinless trunks and come out bloodstained and with bills thoroughly stained. The Skua is a shade more careful, but is not particular until it has satisfied itself. The snowy-breasted gull mentioned above is not so bold as any of its fellow feasters, yet they quarrel for a good place on a carcass. The pigeon-like Sheathbill, which is almost pure white, deigns to bloodstain its pretty coral-red feet, but the gull does not enjoy the act. Others there are, but all give way at once with the advance of the Skua.

Although the Great Skua is a ravenous creature the work of clearing away offensive seal bodies is performed by the hundreds of white gulls which flock to the scene, and when they rise the sky looks a feathered picture. A wonderful provision of nature is here shown. Hundreds of tons of organic matter lie upon a beach that early show signs of reaching a putrid stage. Thousands of birds, the youngest of which have possibly never tasted flesh, and the oldest ten or twenty years ago or never, without hesitation settle down to the strange meal, and in a week they will have removed from the shore hundreds of tons of decaying animal matter that would have caused trouble if these scavengers had not been provided. On the mainland it would have been "For wheresoever the carcass is, there will the eagles be gathered together."

With its general night habits I am not acquainted, but I know it is, under the newer circumstances, up and doing at 2 a.m. along with Giant Petrels and white gulls (only one species here). Although there is not that revelry by night that there is by day, just as much eating seems to be done. Possibly many species of petrels join, and in their own quiet way do much to reduce the superfluous food.

Each pair of Skuas seems to patrol a given area, and when you are approaching their nest they make a hard, screeching noise, continuing so till you retire. In self-preservation I was forced to kill an adult with a stick, as it attacked me. If you take their eggs they make a great commotion, with harsh, pitiful, and uniform notes, but very little is said by them when they have taken the eggs of other birds.

The fearless nature of the bird astonished me. One was captured by the hand while it was feeding on a dead seal, so intent was it upon the work. Stones were repeatedly thrown at others,

yet they did not move. They were both bold and inquisitive. The first few pebbles were pursued, although passing unpleasantly close. If you place killed ducks behind you while resting a Skua will quietly arrive and pick the flesh from every large bone in a few minutes. A seal's tongue was nicely cleaned and placed on a bank, but a Skua, shortly after, was found comfortably perched upon what was left of it, finishing the last portion. Any-one would think Skuas always had empty stomachs, as they have audacity enough for any venture in the provender-providing way. Constantly I found it to be a cannibal. One sex was killed by one of our men in the morning, and by noon it was nearly all eaten by the other sex. This occurred with the paired birds. There is an action about the species I did not quite understand, because we had stunned one of a pair which was pestering us at close quarters. It was dazed, and tottering round; it could not rise for some moments. In the meantime the mate pecked it unmercifully as if angry with it for showing cowardice. Most likely it was not aware of the circumstances, as the knock was given in a moment. The fallen warrior soon flew away. It appears to me to have the disposition of the pugnacious Kalij Pheasant. Mr. Frederick Wilson writes:—"On one occasion I shot a male, which lay fluttering on the ground in its death struggles, when another rushed out of the jungle and attacked it with the greatest fury."

Even ducks and Giant Petrels were procured for museum purposes with a stick. A camera leg procured nearly all the species, and only on two occasions did I shoot birds. These also could have been clubbed at a later date.

December is the month for egg-laying. I found hard-sat eggs on 2nd January, measuring (a) 2.9 inches x 1.95 inches, (b) 2.85 inches x 1.85 inches, (c) 3.05 inches x 2.15 inches. On two occasions I found a nest very close to a solitary one of *Diomedea chionoptera*, Salv. The Albatross seldom left the eggs, and when sitting it could easily defend itself. The Skua knows what the "clipping" of its mandibles means should it get too close. On 24th January downy young were about Greenland Harbour. In Christmas Harbour, also of Kerguelen Island, on 4th January I counted five pairs of downy young in or near their nests. On first sight of me they stayed in their nests on the ground, but when I returned in an hour or more they had left. This, no doubt, was the result of the parents' provision for their offspring. The young are brownish-grey, with bill and eyes black, and slaty legs. Nests are placed in Azorella grass, which is the only natural bed on the island that is tolerably dry. Unlike the other gulls, it does not make a nest beyond tearing into shreds portions of this strange grass, and sitting upon the whole. The close surroundings are well beaten down by the parents' feet, and remnants of

duck eggs are sprinkled around it. Pieces of Prions and regurgitated remnants lie about the brownish, grassy indent. The nest is generally formed on *Azorella* that is broad and flat. This extraordinary grass, that has one close ally only (South America), grows in convex-like nodes. On portions, that appear as if decapitated, the young are kept tolerably dry.

The *Azorella* grows in a wavy formation, having its stems 2 to 3 feet high, and so innumerable and compact that I have walked for hundreds of yards along the top of the dense perennial growth without sinking an inch into it. It is green only at the tips, and because the light cannot penetrate beneath the surface of its massed tips there is no need of chlorophyl below. The stems branch freely, and, like a person being in a dense crowd of people, not one stem is allowed to droop. The Skuas seem to know that moisture does not lie in *Azorella*, and use it in the interests of their offspring. A young bird about to leave its nest, and nearly as large as the parents, is half down and half feathers. While endeavouring to hide itself it lays the head and neck upon the ground, and when approached the head rotates till the chin is uppermost. It may turn round even further and open its mouth, with a frightened look and a fearing call. The young birds nearly always stalk about the grass with their heads down and neck drawn inwards. The most common notes are four in number, the fourth much prolonged, all high and plaintive.

Many details in the field history of this species have been recorded, information on which may be gathered from the *Ibis*, January, 1900; "Phil. Trans.," vol. clxviii. (1879); "Miscell. Coll. Smithsonian Institution," vol. xiii. (1877), &c.

A TRIP TO THE RICHMOND RIVER DISTRICT.

PART I.—GENERAL AND BOTANICAL—*continued*.

BY A. CAMPBELL, JUN.

(*Read before the Field Naturalists' Club of Victoria, 9th July, 1900.*)

ANOTHER very common plant is the large aroid, *Colocasia macrorrhiza*, Schott., commonly called Cunjevoi, which flourishes on the leaf-covered ground. Many of the plants are of such an age that their succulent stems extend along the surface for 6 feet or more, and so luxuriantly do they grow that it is no uncommon thing to see a leaf whose blade is 5 feet in length. This plant has a small greenish arum-like flower with a very heavy perfume. The masses of these pretty plants are broken here and there by the brown forms of decaying logs, on which are fantastic shapes of fungi. The mycelium, or roots, of one species of fungus give out a phosphorescent light, which has a very weird appearance.

Going along a track after dark you may see a patchy line of bluish lights marking the position of a log. It has been said that a person could read by the aid of the light emitted, but that is incorrect. The largest individual patch I saw was about 6 square inches in area.

A ground orchid is occasionally met with—a species of *Calanthe*—the corrugated leaves of which are about a foot in length. One plant will contain six or eight crowns, each bearing a flower-stalk 3 feet in height. As far as I could calculate the spike is flowering for fully three months of the year, commencing in November and lasting till the end of January. Being an indefinite inflorescence, the flowers on the base are finished long before the highest ones are out. The individual flowers are 2 inches in length, of a whitish colour, and odourless.

Yet another plant worthy of notice is the Walking-Stick Palm, *Baculeria monostachya*. It looks very pretty, with its small red fruit hanging gracefully in streams. The palm rarely grows more than 10 feet high, but its thin, flexible stem is of an extremely tough nature.

Terrestrial ferns are not common, but these scrubs are the home of epiphytal ferns and orchids. On every teak tree are found plants of *Platyserium alaicorne*, Elk's-horn Fern, and *P. grande*, Stag-horn Fern, and the new comer can only stand and gaze in amazement at the beautiful clumps of these ferns, some no less than 12 and 15 feet in circumference, growing like giant excrescences on the branches of the trees. And what a sight it must be in the springtime to see those lovely tree orchids, *Dendrobiums*, when the gorgeous flowers stream forth and fill the whole air with fragrance! Who would believe the Rock Lily of Sydney and the tree orchid of the "Big Scrub" to be identical? No doubt the tropical existence makes the difference. The flower-stalk in one instance will, perhaps, measure 9 inches, while in the "Big Scrub" 2 and 3 feet is no uncommon length; for I could see in the now withered stalks the evidences of their former glory. The teak trees appear to be the most favoured, for though the Bird's-nest Fern, *Asplenium nidus*, is frequently on other trees, the *Platyseriums* and the *Dendrobiums* prefer the teak. The tree orchids are sometimes seen growing in clumps among the Stag-horns, but they usually occupy positions of their own, and thrust their tubers up like so many fingers towards the light. There are two species, *D. speciosum* and *D. hilli*, the latter being the rarer. It has pure white flowers, otherwise the two kinds are similar. Another species of orchid has tubers of a long thin nature, about the length and thickness of a lead pencil. Still another variety common on all trees is very small, and bears three or four dull yellow bell-shaped flowers on a stalk.

Now to deal with some giants of the vegetable kingdom. The

teak tree will take first place for size and magnificence, without taking into consideration its beautiful burden of epiphytal plants. It grows to a great height, and its trunk is often a solid 6 feet, furnishing excellent timber for building purposes. The house at which I was staying was built entirely of teak, sawn and dressed within 200 yards of the spot. Another very serviceable tree is the Mountain Ash, the wood of which is useful for fencing. Palisade fences are in some places built to keep back the native vermin in the scrubs. The small Wallaby, or "Paddymelon," is the principal nuisance. The Buoyong is a handsome tree, and a very remarkable one from the way in which the butt is fissured and ridged. The roots appear to leave the ground some yards away and run up to meet the trunk, forming narrow but solid partitions. Thus a tree that is 4 feet thick at 12 feet from the ground would spread over a surface of perhaps 6 yards in diameter. In clearing, the settlers surmount this by erecting a platform about 10 feet up, and from there proceed to cut the tree through. The platform is simply a plank, with one end resting in a niche cut in the tree, the other end being supported by two forked saplings. The Buoyong, together with the teak and ash, is very subject to the ravages of white ants: the giant semicircular, dark-brown coloured nests of these little insects are like great exudations on the tree. The ants' nests are also plentiful on the charred stumps left in the clearings.

The "Big Scrub" was once the home of the Red Cedar, but thousands of trees have been removed, and now not a single specimen above a foot in diameter could be found. The beautiful red timber is well known to all. The tree also is beautiful, with its straight smooth stem and broad finger-like leaves. In spring the young leaves, thrown forth from the tips of the branches, are of a rich purple colour, and I am told that one plan used by the cedar-getters to discover the whereabouts of the cedars was to watch for this colour amidst the sea of vegetation. Then tracks had to be cut from one to another, to allow of teams entering to draw away the logs. These tracks are still seen penetrating the scrub in all directions. Many other trees besides those already mentioned constitute the "Big Scrub." There are the Native Tamarind, the Fig tree, the Bean, the Beef-wood, the Yellow Cedar, and the Stinging Trees. The last-mentioned are worthy of note because of their peculiar properties. There are two varieties, one growing to some size, the other being of the nature of a shrub. The large heart-shaped leaves of the former are covered with minute hair-like spines, which give them a light colour and a downy appearance; the smaller species has smaller leaves, with serrated edges. The sting inflicted is very severe. If a hand or arm is badly stung the limb will swell and remain benumbed for a long time after. More than once I fell

foul of these spiteful trees, but experience, however, soon taught me to keep a look-out for them. A good remedy was to apply cold water, which eased the burning pain and checked the swelling.

A truly parasitical plant is the Fig tree, *Ficus australis*. Although a specimen may assume gigantic proportions and tower above its fellows, yet it has done so at the expense of some other tree. Figs in all stages of their existence are seen in the scrubs. The seed is carried by birds, and may be deposited in a hollow, or in a "calabash," or clump of Staghorns. Finding sufficient nourishment, it germinates and thrives. The roots make their way downwards, enveloping the tree trunk with fibres until they reach the ground. These roots afterwards become as iron bands, and effectually strangle the host tree, which in time rots out, leaving the skeleton frame-work of thickening roots as a trunk to the Fig tree. The final stage is reached when the trunk has grown solid, and the branches tower above and o'erspread the other trees as a gigantic umbrella, bearing tons upon tons of purplish-black fruit, upon which the Fruit Pigeons and other frugivorous birds feed. The Fig tree grown in the open affords excellent shade; similarly does the Bean tree, which is also remarkable for the long pods of enormous beans it bears. The Native Pine is found on the outskirts only of the scrub, growing on an exposed ridge or hillside.

The native animals of the "Big Scrub" are not numerous. They are, briefly, the Dingo, Paddymelon, Bandicoot, Flying Fox, and Ant-eater (*Echidna*). The small Wallaby (I do not know why it is called "Paddymelon") troops out in dozens towards evening to feast and fatten on the farmers' crops.

Of lizards there are two kinds, the Iguana and a long jet black species frequenting the rotting logs in the scrub. Snakes are not uncommon; the poisonous species are the Black and the small "Bandy-bandy." The Carpet and Tree Snakes are non-poisonous. One day I came across a Carpet Snake about 8 feet long lying prone and immovable. It had evidently just taken in a week's provisions in the shape of a "Paddymelon," judging by the thickness of its abdominal region. If ever a snake was gorged that one was; but for darting out its tongue now and again there was not a movement. This species is especially fond of pilfering in the poultry yards, making raids during the hours of darkness. The Tree Snakes, of which there are two species, the brown and the green, are termed Whip Snakes by the local people on account of their long, thin, tapering bodies. They create great alarm sometimes by coming about the houses, or into the roof of a barn, for instance, where they can easily procure their food, which consists solely of Tree Frogs. These green tree-climbing frogs are indeed a nuisance, and are found every-

where. During the daytime they shelter in the spouts or under the eaves of a house, then at evening it is amusing to see them coming out. After sitting on the edge of the roof for some minutes they take a leap and land on the ground with a thump, which varies in sound according to the size of the frog. On a wet night, especially, they make a hideous noise. Some take up prominent positions on stones, others cling to the side of the house or a tank, or perchance sit on your window sill, and while you are endeavouring to sleep pour forth their chorus. The frog on the window sill and the one around the corner will deliver a duet perhaps, the rest chiming in, their individual voices ranging from a deep croak to a piping treble. At the house where I was staying the youngest member of the family possessed a waddy, or "frog-stick" as he called it, with which he would sally forth occasionally and silence the most noisy frogs. If rain falls during the daytime frogs in their hiding places immediately begin to croak; in the scrub some are heard high up in the trees. But a stranger is not long in the scrubs before he is made acquainted with the leeches and ticks which infest the moist leaf-covered floor of the forest. These are two impedimenta of the first degree. The tick has been known to cause death with domestic cats, dogs, and poultry, while as a consequence of their abundance the native animals and reptiles suffer.

ON THE CRUSTACEAN, *PHREATOICUS AUSTRALIS*, FROM TASMANIA.

BY O. A. SAYCE.

(Read before the Field Naturalists' Club of Victoria, 10th Sept., 1900.)

I LATELY received from Professor Baldwin Spencer a few Crustacea collected by him from Lake Petrach, a small freshwater mountain lake situated near the centre of Tasmania, and, on examination of the specimens I found, in association with two new species of Amphipods, a few specimens of *Phreatoicus australis*.

Before comparing it with the original species from Mt. Kosciusko, I should like to call the attention of my fellow-members to the family to which it belongs, and to enumerate the species and their distribution as at present known.

The Phreatoicidæ is a very small but important family of Crustaceans, of somewhat shrimp-like form, found only in Australasia, where their habitat is either in subterranean or surface fresh waters, or in burrows in forest country. They belong to the extensive order Isopoda, but in structural features are widely separated from other existing members of that group, and exhibit more than any others affinity with the order

Amphipoda. The first genus was instituted by Dr. Chilton for a blind species, *Phreatoicus typicus*, found in the subterranean waters of Canterbury, New Zealand, and was collected from water pumped from a depth underground of some 30 feet; later he described in the "Transactions Linnean Society of London," 2nd series, vol. vi., part 2, another species, *P. assimilis*, from the same habitat, and with these two were associated other small blind Crustacea. He also described and named another species, *P. australis*, possessing normal vision, which was collected from surface water on the summit of Mt. Kosciusko, N.S.W., at a height of 5,700 feet, "Records Australian Museum," vol. i., page 149.

In the "Transactions of the Royal Society of Tasmania" for 1892, p. 32, Mr. G. M. Thomson records the occurrence of this species from the summit of Mt. Wellington, 4,100 feet, but his identification is doubtful, due to having received from Tasmania but a single immature specimen.

During the present year I received from Mr. J. Shephard a few Crustacea that he had collected from a freshwater runnel, at an elevation of 2,000 feet, during our Club excursion to the Plenty Ranges; among these was a new blind species, which, in compliment to our president, I named *P. Shephardi*, and described in the "Proceedings of the Royal Society of Victoria," n.s., vol. xiii., page 26.

Allied to this genus are two other genera, and each contains but a single species—one a very large form, *Phreatoicopsis terricola*, Spencer and Hall, of terrestrial habit, found on hill-sides in the Otway Forest (Proc. Royal Soc. Victoria, n.s., vol. ix., page 12), and the other, *Phreatoicoides gracilis*, Sayce, of long slender form, with the branchial appendages hanging free, from a little stream near Thorpdale, Gippsland (Proc. Royal Soc. Victoria, n.s., vol. xii., page 122).

I exhibit to-night examples of the genera, and should members during their collecting excursions find similar or allied forms, it would be interesting to record them.

Of those received from Professor Spencer, from Lake Petrach, Tasmania, at an elevation of 2,900 feet, four were males and two females. At first I was inclined to regard them as a new species, principally in consequence of the shape of the hand and the armature of the terminal segment, but after examining some specimens of *Phreatoicus australis* from Mt. Kosciusko, sent through the kindness of the trustees of the Australian Museum, I regard the differences from that species but slight and varietal.

The following differences may be mentioned as observed in the Lake Petrach specimens as compared with those from Mt. Kosciusko:—Firstly, the gnathopods of the male have the palm oblique, almost straight, with a notch near the articulation of the dactylus, and the margin is defined by a fringe

of 13 triangular spines, that commence just beyond the notch and extend to the postero-distal angle; these spines are strongly denticulated on the edge that faces posteriorly, and the denticulations become more numerous, and also the spines longer and more acuminate, toward the posterior angle. Parallel with this row is a row of simple setæ that extend for a short distance beyond the angle along the posterior border. In the Mt. Kosciusko specimens the palm is strongly convex, and, in addition to the row of simple setæ, instead of 13 denticulated teeth there are only 9 and these are of similar form, but not toothed. This character was constant in each of the specimens examined. Secondly, the terminal segment has the inferior margin fringed with 9 spinules (not 15 or 16 as mentioned by Chilton), which gradually increase in length hindwards, and all are more or less pectinated at the tips, with the exception of the last one, which is simple; also, in addition to these, there is distally a sub-marginal cluster of three little pectinated spinules. The uropoda are similar to Chilton's drawing, with the addition of having a very conspicuous long spine at about half-way along the upper margin of each ramus. In other respects of form they essentially agree.

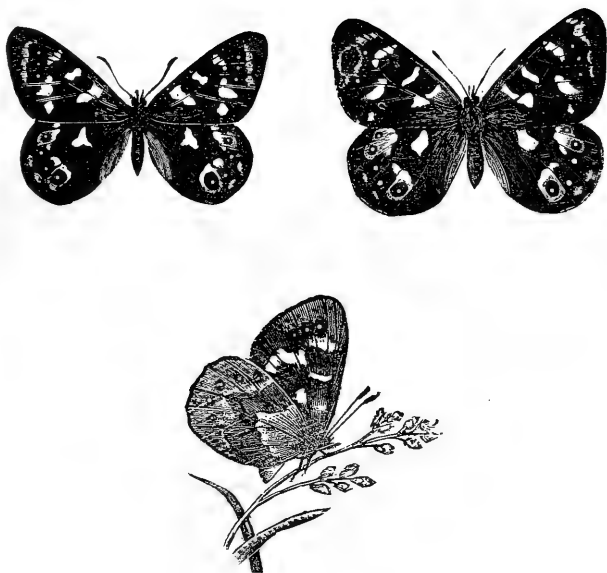
DESCRIPTION OF A NEW AUSTRALIAN BUTTERFLY *XENICA TASMANICA*.

BY GEO. LYELL, JNR.

(Read before the Field Naturalists' Club of Victoria, 10th Sept., 1900.)

EXPANSE.—Male, 35 mm.; female, 37–38 mm. Face brownish-black; crown ferruginous. Palpi dark-ferruginous above, fuscous below. Antennæ ferruginous, club brownish-black, tipped with ferruginous. Thorax and abdomen brownish-black; legs reddish-ferruginous.

Wings.—*Upperside* rich brownish-black, with interrupted transverse bands of whitish-ochreous; basal fourth clothed with long hairs, greenish-black on primaries and fuscous on secondaries; cell at base and between bands black. *Primaries*.—First band from upper median vein at $\frac{1}{4}$ and not reaching vein 1 at $\frac{1}{2}$, dilated outwardly below cell, that portion within cell much broader in male than in female. Second band from upper median vein at $\frac{2}{5}$ to lower median at starting point of vein 3. Third band from costa at $\frac{3}{5}$ to vein 1 at $\frac{6}{7}$ of dorsum (hind margin), but interrupted at veins 4 and 2, and dilated outwardly between veins 2 and 3. Between third and fourth bands a transverse row of three white-centred black spots. Fourth band narrow, diminishing, interrupted at veins, from below costa at $\frac{8}{11}$ to just before vein 3.



XENICA TASMANICA, *Lyell*.

(Male, female, and underside.)

Colour of fourth band ferruginous, paler beyond vein 5. Cilia brownish-black, sprinkled with ferruginous and fuscous hairs. *Secondaries*.—First band represented by a whitish-ochreous blotch from costa at $\frac{1}{2}$ to lower median vein at starting point of vein 2, dilated outwardly. Second band broad, following curve of wing from costa just before apex to vein 2, inner third whitish-ochreous, outer two-thirds ferruginous; broadly interrupted on vein 4 by a patch of brownish-black ground colour. Placed upon this band is a series of five white-centred black spots, following contour of termen (outer margin) at $\frac{3}{4}$ from base. Two hind marginal indistinct whitish-ochreous, sometimes ferruginous, longitudinal spots between veins 5 and 4 and 4 and 3. Cilia as in primaries.

Underside. — *Primaries*. — Apical fourth reddish-ferruginous, cell beyond first band black, rest of wing dull brownish-black. Whitish-ochreous bands broader but more indistinct than on upperside. Upper half (within cell) of first band sometimes almost obsolete, lower half of third band confluent. Upper portion (to vein 5) of fourth band merged into ferruginous ground colour and barely distinguishable. White-centred black spots distinct, sometimes rather larger. *Secondaries* reddish-ferruginous, with darker broad median band, indented in centre, and thence broadening to dorsum. First band continued by a narrow indistinct irregular band from starting point of vein 2 to vein 1 at $\frac{1}{3}$ of dorsum, thus forming the anterior margin of the darker median band. Second band confluent, only the whitish-ochreous anterior third clearly seen, the posterior two-thirds more or less merged into ground colour. This band forms the posterior margin of the darker median band. Dots as on upper side, but fifth dot smaller instead of larger than the others. The two hind marginal spots only faintly traceable as paler ground colour.

Strahan, Tasmania, in October and November; twelve specimens.

This butterfly is quite distinct from any other species of the genus. It approaches most closely to *Xenica hobartia*, West., but is much darker, while transverse bands are much lighter and differ in number and extent. The distinct median band of hind wing, especially noticeable on the underside, is peculiar to this species. It was captured last year on the West Coast of Tasmania by my friend Mr. H. F. Norman. He writes that he found it quite commonly, flying over the "button grass" country (open, treeless, shrub-covered hills with marshy land between) round Strahan. He noted it from close to sea-level to about 500 ft., but it will, no doubt, like the other species of this genus, be found to occur at much greater altitudes. I have also seen a specimen

taken by Mr. A. Simson, of Launceston, at Strahan in October, 1897. My thanks are due to Mr. E. Anderson for kindly supplying the illustration.

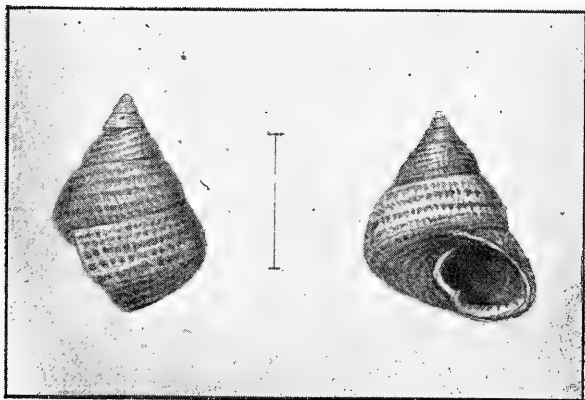
To-night I have placed on exhibition specimens of all the described species of this genus of butterflies (with the exception of *X. ella* and *X. paludosa*) and also a peculiar Tasmanian variety of *X. hobartia*. These comprise—*X. achanta*, Don.; *X. correæ*, Olliff; *X. correæ*, var. *fulva*, Olliff; *X. hobartia*, West.; *X. kershawi*, Misk.; *X. klugii*, Guer.; *X. lathoniella*, West.; *X. leprea*, Hew.; and *X. orichora*, Meyr. *X. ella* was described by Olliff from a single specimen taken near Goulburn, N.S.W., and the type has unfortunately been lost. From the description it was very closely allied to *X. kershawi*, and was most probably only a well-marked variety of that species. *X. paludosa* is described by Dr. T. P. Lucas as allied to *X. orichora*, and, with an expanse of 20–24 mm., is the smallest species of the genus.

NOTE ON THE TYPE OF *THALOTIA DUBIA*, A SHELL DESCRIBED BY TENISON-WOODS.

By J. H. GATLIFF.

(Read before the Field Naturalists' Club of Victoria, 10th Sept., 1900.)

By kind permission I have been allowed to critically examine the abovenamed shell, belonging to the family Trochidæ. It was found at Clark's Island, Bass Straits, is now in our National



Museum, and was described in the "Proceedings of the Royal Society of Victoria," vol. xiv., page 58, as a new species by the

late Rev. J. E. Tenison-Woods, but upon close examination there can be no doubt about its being an abnormal form of *Thalotia conica*, Gray.

On examination the apical portion of about four whorls prove to be identical with those of the last-named species. Something has then occurred to interrupt its ordinary growth, as is plainly shown in the figure (kindly drawn by Mr. F. E. Grant); then the succeeding whorls become abnormally convex, the body whorl especially so, and the shell is proportionately broader than is usual in the normal form.

Tenison-Woods remarks:—"In general form resembling *T. conica*, but smaller and more closely ornamented. The mouth is also an approach to a *clanculus*." This is not accurate. As regards dimensions, of more than fifty specimens of *T. conica* before me from Victoria, Tasmania, and South Australia, those of the largest one are long. 20 lat. 11 mm.; those of Woods's shell are long. 18 lat. 15 mm. The ornament is normal, with the exception of that on the body whorl, which has an intermediate fine spiral thread of granules between the strong spiral ridges, and this extra thread continues round it, gradually getting finer, and disappears on the penultimate whorl; but even this is not altogether a distinctive feature, as it is plainly discernible at the outer lip in some specimens of normal form. Amongst the Victorian specimens before me is a broad form, long. 16 lat. 14 mm., and another smaller one with the body and penultimate whorls almost as convex as that of Tenison-Woods's type, and the mouth of the latter is identical in character with that of many specimens of *T. conica*, excepting that the outline of the outer lip is rounder. In very many species in the family Trochidæ the number of spiral ridges varies in the same species, as also does the number and development of the granules on the ridges.

Considering the facts set forth, Tenison-Woods's species must rank as a synonym of *T. conica*, but it is of abnormal growth.

ADDITIONAL NOTE ON MACGILLIVRAY'S PARRAKEET, *PLATYCERCUS MACGILLIVRAYI*, NORTH.

BY ALFRED J. NORTH, C.M.Z.S.,

Ornithologist, Australian Museum, Sydney.

SINCE the publication of my description of this species in the last issue (p. 91), I have received from Mr. A. S. Macgillivray the skin of a male obtained by him on Leilavale station, Cloncurry River, Queensland. It differs from the type principally in having the feathers of the mantle, back, rump, upper tail and upper wing coverts of a lighter verditer-green and more

distinctly washed with golden-yellow, and the margin of the shoulder and under wing coverts of a much paler blue; the anterior portion of the cheeks are of a slightly lighter blue, and gradually pass into a most delicate bluish-green on the sides of the head and pale verditer-green on the ear coverts; a dull brown crescent, more or less shaded with green, extends from the eyes on to the occiput, and the collar on the nape is much broader and of a slightly richer yellow. This skin averages about the same size as the type, but unfortunately the primaries and feathers of the tail are much abraded, and I cannot give their accurate measurements. In both specimens the ring of feathers surrounding the eye is broken on the anterior part.

With the above Mr. Macgillivray sent the following note:—"These birds are plentiful in the tall gums and tea-trees along the Cloncurry River, but are never seen any distance away from it; they seem to feed a good deal upon the berries of the mistletoe. I only knew of one nest, in the hollow limb of a gum tree, but being at a great height from the ground I could not get anyone able to climb up to it."

As Dr. Macgillivray points out, *et lit.*, it is remarkable that so large and distinct a species should remain for so long undiscovered, and it augurs well for other new birds being found there, if a comprehensive collection was made, especially of the smaller birds of the Cloncurry district.

The type of *Platycercus macgillivrayi*, and of *Eremiornis carteri* (described in the August number of the *Victorian Naturalist*), have been presented respectively by Dr. W. Macgillivray and Mr. Tom Carter to the Trustees of the Australian Museum.

THE EXTINCT AUSTRALIAN EMU.

THE following interesting letter appeared in *Nature* of 31st May last:—

"A THIRD SPECIMEN OF THE EXTINCT *Dromaius ater*, VIEILLOT; FOUND IN THE R. ZOOLOGICAL MUSEUM, FLORENCE. —In January, 1803, a French scientific expedition, under Baudin, visited the coast of South Australia and explored Kangaroo Island, called by them 'Isle Decrès.' One of the naturalists attached to the expedition was the well-known F. Péron, who wrote an interesting narrative thereof. He noticed that Decrès Island was uninhabited by man, but, although poor in water, was rich in kangaroos and emus (*Casuars* he calls the latter), which in troops came down to the shore at sunset to drink sea water. Three of these emus were caught alive, and safely reached Paris. We learn from the 'Archives du Muséum' that one was placed in the Jardin des Plantes, and two were sent to 'La Malmaison,' then the residence of the Empress Josephine. We learn later

that two of these birds lived to 1822, when one was mounted entire and placed in the ornithological galleries of the 'Muséum;' the other was prepared as a skeleton and placed in the comparative anatomy collections. No mention is made of the ultimate fate of the third specimen.

"Péron was unaware that the emu he had found on the Kangaroo Island was peculiar and specifically quite distinct from the New Holland bird; this was found out much later, and *too late*; for after Péron and his colleagues no naturalist evermore set eyes on the pigmy emu of Kangaroo Island in its wild condition! It appears that when South Australia was first colonized, a settler squatted on Kangaroo Island and systematically exterminated the small emu and the kangaroos. When the interesting fact was ascertained that Péron's emu was a very distinct species quite peculiar to Kangaroo Island and found nowhere else, *Dromaius ater* had ceased to exist; and the only known specimens preserved in *any* museum were the *two* mentioned above, in Paris.

"For some years past my attention had been drawn to a small skeleton of a Ratitæ in the old didactic collection of the R. Zoological Museum under my direction; it was labelled 'Casoario,' but was in many ways different from a cassowary; but other work kept me from the proposed closer investigation, and it was only quite recently, during a visit of the Hon. Walter Rothschild, on his telling me that he was working out the cassowaries, that I remembered the enigmatical skeleton. A better inspection showed us that it is, without the least doubt, a specimen of the lost *Dromaius ater*. I afterwards ascertained that it had been first catalogued in this museum in 1833; that most of the bones bore written on them in a bold round hand, very characteristic of the first quarter of the nineteenth century, the words 'Casoar mâle;' and lastly, that during the latter part of Cuvier's life, about 1825-30, an exchange of specimens had taken place between the Paris and Florence Museums. I have thus very little doubt that our specimen is the missing *third* one brought alive to Paris by Péron in 1804-5.

"This highly interesting ornithological relic is now on loan at the Tring Museum, and can be seen there by any ornithologist in England who may wish to examine it. I intend shortly to give a fuller notice of this valuable specimen.

"HENRY H. GIGLIOLI.

"R. Zoological Museum, Florence, 15th May."

TASMANIAN EMU.—It would be interesting to know if any specimens of the extinct Tasmanian Emu exist in museums.

CORRESPONDENCE.

GEOGRAPHICAL DISTRIBUTION OF AUSTRALIAN BIRDS.

To the Editor of the Victorian Naturalist.

SIR,—My remarks in the recent paper on geographical distribution have given rise to some misunderstanding, judging by the critical review of it by Mr. A. J. Campbell. I should, perhaps, have made it plainer that certain additions were previously unrecorded in any work, while others had not been noted in my “Key,” and were additional to it.

Many of the species referred to by Mr. Campbell I credited to the latest compiler, though it would have been better had I found and quoted the original chronicler. Thus, to a certain extent, Mr. Campbell’s criticism is correct.—I am, &c.,

ROBERT HALL.

CENTRAL AUSTRALIAN ANTHROPOLOGY.

IT is satisfactory to be able to report that the proposed expedition of Professor Spencer, F.R.S., and Mr. F. J. Gillen to the northern portion of Central Australia, for the purpose of studying the customs, folk-lore, &c., of the aboriginal inhabitants, has been financially provided for. Though Victoria was likely to derive the greatest results from the investigations proposed, our Government could not see its way to provide more than one-third of the cost. However, a wealthy Melbourne citizen has come to the rescue, Mr. David Syme, the proprietor of the *Melbourne Age*, having generously offered to defray the actual expenses of the expedition, about £1,000. In order that no time may be wasted, Professor Spencer has been in Adelaide in consultation with Mr. Gillen as to the details of the expedition, and arranged for the transmission of the stores required into the interior to several depôts, so that work may be commenced in earnest early in next year. It is pleasing to be able to record such a spirited action on behalf of science by a Melbourne citizen, as hitherto little liberality towards scientific work has been shown by our wealthy fellow-colonists, and we trust Mr. Syme’s example will be the means of inducing others to give assistance where there is apparently no direct return.

Field Naturalists' Club of Victoria.

Exhibition of Wild Flowers.

Members intending to exhibit Wild Flowers are requested to intimate at once the space required, and to have the flowers at the Hall not later than 4 p.m., on Monday, 8th inst.

Sub-Committee:—MESSRS. C. FRENCH, JUN., F. G. A. BARNARD,
J. GABRIEL, and D. LE SOUEF.

ANNUAL PICNIC.

BLACKBURN, 27th OCTOBER.

Trains leave Prince's Bridge at 1.35, 2.15, and 3.45 p.m.

During the afternoon a botanical ramble and visit to the lake will take place. After tea (at 6 o'clock) there will be a musical evening.

Tickets for Tea, 2/- each, may be obtained from Mr. Gabriel, Mr. Haase, or the Secretary.

PRACTICAL EVENING,

MONDAY, 23rd OCTOBER.

Subject:—The Fourth of Mr. Tisdall's Course, dealing with Dicotyledons:—Cruciferae (the Turnip family), Solanaceae (the Tobacco and Potato family).

(Members are desired, if possible to provide themselves with dissecting instruments and microscopes).

Camp Out at Healesville. • •

10th, 11th, and 12th NOVEMBER.

Members desirous of joining please send in their names to Mr. A. Mattingly, Customs House, or Mr. F. G. A. Barnard, on or before 27th October.

NOVEMBER MEETING.

Members will please take notice that owing to the holiday, this Meeting will be on the 19th instead of the 12th.

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JAN 11 1918
VOL. XVII.—No. 7.

NOVEMBER, 1900.

The Victorian Naturalist :

THE JOURNAL AND MAGAZINE

— OF —

The Field Naturalists' Club of Victoria.

PUBLISHED 8th NOVEMBER, 1900.

Editor: F. G. A. BARNARD, Esq.

The Author of each article is responsible for the facts and opinions recorded.

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1900.

Field Naturalists' Club of Victoria.

ROOMS—ROYAL SOCIETY'S HALL, VICTORIA ST., MELBOURNE.

BUSINESS PAPER FOR MONTHLY MEETING.

Monday, 19th November, 1900, at Eight p.m.

1. Correspondence and Reports.

2. Election of Members.

	Proposer.	Seconder.
Dr. Sutton	G. A. Keartland	J. Gabriel
Rathdown Street, Carlton.		

As Country Member:

Mr. F. L. Billinghamurst ..	T. S. Hall, M.A.	Geo. Coghill
National Bank, Alexandra.		

3. Nominations for Membership.

Members making nominations will oblige by handing the full name and address to Hon. Secretary.

4. General Business.

5. Reading of Papers and Discussions thereon.

(Authors are requested to hand in a brief resume of their papers to the Secretary.)

1. By Mr. G. A. Keartland, "On the Collared Plain Wanderer."
2. By Messrs Fulton and Grant, "Note on Occurrence of European Shore Crab."
3. By Mr. D. Le Souef, "Descriptions of some N. Australian Birds' Eggs."
4. By Mr. R. Hall, "Ornithological Notes."

6. Reading of Natural History Notes.

Members who may note any unusual occurrence, or see anything of interest in Foreign or Colonial papers, are requested to inform the Secretary of the same that he may arrange for their bringing them before the meeting; such notes should, however, be brief.

7. Exhibition of Specimens and Conversazione.

Members exhibiting specimens are requested to furnish the Hon. Secretary with written particulars of their Exhibits for record in Minutes and *Naturalist*.

* EXCURSIONS. *

SATURDAY. 17TH NOVEMBER.—Black Rock. Leaders, Messrs. J. H. Gatliff, and H. T. Tisdall. Meet at Flinders Street Station 2 p.m. train. Shells and Seaweeds.

SATURDAY, 1ST DECEMBER.—South Morang. Leader, Mr. D. Best. Meet at Spencer St. Station 1.35 p.m. train. Entomology.

THE
Victorian Naturalist.

VOL. XVII.—No. 7. NOVEMBER 8, 1900.

No. 203.

FIELD NATURALISTS' CLUB OF VICTORIA.

A SPECIAL general meeting of the Club was held in the Royal Society's Hall on Monday evening, 8th October, 1900. Mr. T. S. Hall, M.A., vice-president, occupied the chair, and about 80 members and visitors were present.

ALTERATIONS TO RULES.

On the motion of Mr. J. H. Gatliff, seconded by Mr. D. Le Souëf, clause (b) of rule 4 was altered by the addition, after the words "journal monthly," of the following provision, viz. :—"Persons residing beyond a radius of fifteen miles from Melbourne shall be deemed country members, and pay an annual subscription of ten shillings per annum, and shall have the same privileges as ordinary members;" and to this was added, on the motion of Mr. J. H. Gatliff (for the chairman), seconded by Mr. F. G. A. Barnard—"Country members may obtain books from the library on payment of carriage or postage both ways."

On the motion of Mr. J. H. Gatliff, seconded by Mr. H. T. Tisdall, the words "assistant secretary and librarian" were substituted for "two secretaries," in rule 10.

The ordinary monthly meeting was then held.

CORRESPONDENCE.

From Mr. J. S. Maddock, 15 Hanover-street, Windsor, asking for donations of specimens of Victorian natural history to be forwarded to the Victoria Board School Museum, Wrexham, North Wales.

REPORTS.

A report of the excursion to Glen Huntly on Saturday, 15th September, was read by the leader, Mr. R. H. Cummins, who stated that, apparently owing to recent wet and cold weather, there was a dearth of animal life in the Rosstown Swamp, the scene of the afternoon's collecting. Branchipus and Lepidurus, usually very common there, were very scarce. However, an interesting object to the general biological student was the spawn of the frog, *Limadynastes tasmaniensis*, which was found in very early stages of segmentation.

A report of the excursion to Sydenham on Saturday, 29th September, was presented by the leader, Mr. T. S. Hall, M.A., who stated that some twelve members had spent a very enjoyable

afternoon in a visit to the basaltic columns on the bank of the Saltwater River, and exhibited photographs of the locality by Messrs. J. Shephard and R. Hall. Mr. C. French, jun., reported that the botanical results of the afternoon had been fairly good. Among the more uncommon plants seen were *Helipterum anthemoides*, *Calycotrix tetragona*, and *Cassia eremophila*, and altogether some fifty plants were noticed in bloom.

ELECTION OF MEMBERS.

On a ballot being taken, Mr. F. E. Grant, Union Bank, Melbourne, and Mr. S. W. Fulton, Exchange, Melbourne, were duly elected members of the Club.

ELECTION OF OFFICE-BEARER.

There being no other nomination, Mr. W. J. M'Caw was elected to the vacant position of assistant secretary and librarian.

PAPER.

By Mr. F. M. Reader, F.R.H.S. (communicated by Mr. G. Coghill), entitled, "Records of Plants Naturalized in Victoria since 1893."

This paper, in which the author gave a brief list of the plants which he considered had become naturalized in Victoria since the publication of the last list by the late Baron von Mueller in the *Victorian Naturalist*, vol. x., page 144, and enumerated 58 species, was taken as read.

EXHIBITION OF WILD FLOWERS.

As an introduction to the exhibition of wild flowers, Mr. H. T. Tisdall gave a short lecture on the orchids, showing by means of blackboard illustrations the construction of these interesting flowers, and the uses of the various parts, and urged those members who had the opportunity to endeavour to find out by what insects our native orchids are fertilized, suggesting that possibly night-flying moths were the responsible agents. Several members took part in the discussion which ensued, but no definite information was forthcoming.

The following were the principal exhibits of wild flowers:—

By Miss Cochrane, about 30 species from Sandringham, including *Ricinocarpus pinifolius*, *Prasophyllum elatum*, *Thelymitra flexuosa*, *Pterostylis barbata*, &c.

By Mr. G. Coghill, about 25 species from Ringwood, including *Aster stellulatus*, var. *lyrata*, *Caladenia suaveolens*, &c.

By Mr. F. G. A. Barnard, about 25 species from Warrandyte, including *Hibbertia obtusifolia*, *Comesperma volubile*, *C. ericinum*, *Acacia juniperina*, &c.

By Mr. R. H. Cummins, about 12 species from Sandringham, including *Thelymitra epipactoides*, &c.

By Mr. C. French, jun., and C. Walter, about 40 species from Dandenong Ranges, including *Pultenea daphnoides*, *P. stricta*, *P. gunnii*, *Grevillea alpina*, *Goodia lotifolia*, *Pimelea flava*, *P. axiflora*, *Acacia leprosa*, *Pterostylis cucullata*, var. *alpina*, *Caladenia menziesii*, &c.

By Mr. R. Hall, about 30 species from Nar-Nar-Goon, including *Zieria smithii*, *Styphelia ericoides*, *Tetratheca ciliata* (white variety), also *Lycopodium densum*.

By Mr. G. E. Shepherd, about 40 species from Somerville, including *Sprengelia incarnata*, *Epacris obtusa*, *E. impressa* (red and white varieties), *Dillwynia floribunda*, &c.

By Mr. H. T. Tisdall, about 20 species from Eltham, including *Grevillea rosmarinifolia*, *Senecio dryadeus*, *Caladenia carnea*, *Pterostylis nutans*, &c.

By Mr. H. Wilcox, about 40 species from Mornington Junction, including *Tetratheca ciliata* (white variety), *Diuris longifolia*, *D. pedunculata*, *Caladenia suaveolens*, *Prasophyllum elatum*, &c.

NATURAL HISTORY NOTES.

Mr. H. C. Smart forwarded a note recording the finding of the White-browed Tree-creeper, *Climacteris superciliosa*, North, for the first time in Victoria at Lake Boga in August last.

Mr. R. Hall recorded the Chestnut-rumped Tit and Red-capped Robin as foster parents of the Bronze Cuckoo.

EXHIBITS.

By Mr. A. Coles.—A branch of Silver Leaf and Paper Bark of Rhodesia, and wood from Zambesi River, South Africa.

By Mr. C. French, jun.—Photographs taken by Mr. E. Pescott, of Cabbage-tree Palms, *Livistona australis*, growing at Cabbage-tree Creek, East Gippsland.

By G. A. Kearnland.—Skins and eggs of Collared Plain Wanderer, *Pedionomus torquatus*.

By Mr. H. C. Smart.—White-browed Tree-creeper, *Climacteris superciliosa*, recently obtained at Lake Boga. New for Victoria.

By Mr. Chas. Walter.—*Epacris paludosa*, R. Brown, collected by Ed. E. Pescott at Cabbage-tree Creek, East Gippsland, previously recorded in Victoria only from the North-Eastern alpine districts.

A comparatively early adjournment was made, to enable those present to examine the wild flowers exhibited, after which the meeting terminated.

EXCURSION TO SYDENHAM.

To the traveller by the Bendigo train the locality around Sydenham station, formerly known as Keilor Road, does not look very promising for an excursion by members of this Club, but on Saturday, 29th September, about fourteen members and friends detrained there to visit the basalt columns situated on the western branch of the Saltwater River, about two miles north of the station. Looking at a map of the County of Bourke it will be noticed that the Saltwater River forks about six miles above Keilor. The left or eastern branch, heading from near Lancefield, and flowing through Bulla, is generally known as the Deep Creek, while the right or western branch, rising in the Dividing Range west of Macedon, is known under a variety of names, such as Gisborne Creek, Macedon River, Jackson's Creek, and Saltwater River. About two miles above the junction, in a bend of this branch which adds a north-easterly prolongation to section 29, parish of Maribyrnong, the cliff with the columns is situated, though, being on the opposite bank of the stream, it is really in section 10 of the parish of Tullamarine. The district was geologically surveyed by Aplin some forty years ago, and though on the Quarter Sheet No. 7, S.E., he made the note "Symmetrical basaltic columns 50 to 60 feet in height," the spot seems quite unknown to Victorian geologists, notwithstanding that it is not more than 16 miles by road from Melbourne, and within easy walking distance of a railway station. Leaving the station and making our way across the plain, from a slightly more elevated portion a number of volcanic hills or vents were seen to stretch across the north-western and northern horizons, no doubt the sources of the extensive basaltic formation over which we were walking, and which extends right down to the shores of Port Phillip. Crossing the Mt. Alexander road about three-quarters of a mile on the Melbourne side of the Holden Inn, we followed a well-used track leading down into the valley, and ending nearly opposite the cliff. Though the valley is almost destitute of trees, yet in the springtime, when the grass paddocks and the crops on the hillsides are vividly green, it affords many pretty bits of scenery, being really a deep, winding gash cut through the basalt of the Keilor Plains. We estimated its depth by barometrical readings at about 170 feet, and the bed of the stream as being about 220 feet above sea level.

The basalt of the plains is a thin sheet, and cliff sections show that it flowed over almost level sands, probably of Miocene age. These sands in their turn lie on an almost level surface of up-turned Palæozoic rocks, which are either Silurian or Ordovician, it is not known which. Where the valley displays sections of this nature there is nothing very striking about the basalt—it



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BASALT COLUMNS. SYDENHAM.



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resembles the rock shown commonly to the west of Melbourne. In some places, however, the lava has filled in old valleys formed by the ancient streams, and where these old river courses have been cut across by the present stream we see, in favourable spots, phenomena such as are displayed at the present locality. As the river bed is still occupied in places by basalt which is in its natural position, it is clear that the Saltwater River is flowing here at a higher level than it was before the lava outflow, and it will also be noticed that fully 200 feet in thickness of lava is exposed in section.

As will be seen from the photographs the most peculiar thing about the basalt where its thickness is greatest is the fact that it is divided into columns. In the present case single columns are shown 60 feet in height and about 18 inches in diameter. Where the stream strikes the base of the cliff, so that a good fresh face is maintained, the columns are as clean cut as with a saw. In other places, where the columns are not so freshly exposed, they are cut into short lengths by transverse joints, and the slightly weathered blocks look like piles of cheeses. The unweathered columns are marked by transverse banding, so that, as was suggested by Mr. G. Sweet, F.G.S., with whom I visited the section early in the present year, they look like piles of earthen tiles which have become fritted together by overheating in a kiln.

Columnar structure is common in igneous rocks, and its cause is not difficult to seek. To take the present case—basalt is a rock made up of a number of interlacing crystals, the nature of which we need not at present consider. In the molten condition the different minerals are mixed into practically a homogeneous mass. As cooling takes place these minerals separate out from the common mass, and as crystallization is accompanied by diminution in bulk, a shrinking takes place in the rock. Besides this, there is the simpler contraction caused by mere cooling. It is owing to the shrinking caused in these two ways that the divisional planes are produced. If the sheet is thin and exposed on its upper surface to the atmosphere the cooling is comparatively rapid, and the divisional planes are irregular. In thicker sheets, especially at the base of the flow, and in dykes, the divisional planes are usually more regularly developed, and a columnar structure arises. The transverse joints in the columns are produced by the same cause.

Owing to the way in which the columns are formed, they stand at right angles to the cooling surface, which in the present case is formed by the sides of the valley trough in which the lava flowed. Some of the columns in the photographs are seen to be vertical, while others are horizontal where they abut on the steep sides of the old valley. In some cases, owing to the fact that the present stream cuts the course of the old one obliquely, the ends

of the columns are seen jutting out from the cliff face, which appears as though covered with tiles. But space forbids a discussion of many other interesting points which were noticed during our excursion.

Several members devoted themselves more or less to botany, and Mr. C. French, jun., who acted as botanical leader, reports that fully fifty species of plants were noticed in flower, of which the most interesting collected were *Zygophyllum bilardieri*, *Dodonaea viscosa*, *Euxtaxia empetrifolia*, *Cassia eremophila*, *Acacia acinacea*, *Calycotrix tetragona*, *Eucalyptus melliodora*, *Helipterum anthemoïdes*, *Nicotiana suaveolens*, and *Myoporum deserti*. The ferns *Cheilanthes tenuifolia* and *Grammitis rutifolia* were also noticed growing in the interstices of the basaltic columns and among the rocks.

T. S. HALL.

A TRIP TO THE RICHMOND RIVER DISTRICT.

BY A. CAMPBELL, JUN.

PART II.—BUTTERFLIES AND BIRDS.

THE tropical and semi-tropical regions of the world are famed for the glory of colouring and the luxuriance of their insect and bird life. The "Big Scrub" is no exception. Of insects we find the butterflies the most attractive, while some of the birds are of wonderful plumage, and several families, besides numerous individual species, are not known in the more temperate zones. Butterflies are seen in myriads on a bright day, with gay colouring and quick flight searching in and out among the blossoms. The well-known family of *Papilio* is perhaps the best represented as far as numbers go; but the Richmond River district can claim a species peculiar to itself, *Ornithoptera richmondia*, which is a large insect, measuring from $4\frac{1}{2}$ inches across. The male is very beautiful, with its broad markings of brilliant green and velvety-black, set off with a yellow abdomen, while the female, which is much the larger, is a sooty black, with whitish patches on the fore wing and dull gold and silver on the hinder. The genus is named from its heavy flight, which is supposed to resemble that of a bird. The female is quite a common object during the early summer months, pursuing its solitary way over the fields or feeding, with hundreds of other smaller butterflies, on some flowering scrub tree; but the male does not usually put in an appearance until late in December, when an exceptionally hot day will free them all from their chrysalids, hanging suspended among the creepers or in the branches of the trees, and on the morrow their dazzling green and black forms are seen everywhere. This is the conclusion I came to from my own experience, for on New Year's Day there was a lull in the rains and the day dawned fair;

the sun soon enveloped the place in a steaming heat, the thermometer registering 98° in the shade. Next morning two strange butterflies were reported to me in the garden; they were soon in the killing-bottle, and they were the first I had seen of the beautiful male, for previously none had been about. But shortly after, when I paid a visit to the Lantana bushes by the roadside, I was met with a sight I shall never forget. I shall simply say 18 males were captured within the first half-hour. There were few if any of the females about at the time, but I noticed that the males were in couples—wherever there was a green and black insect dodging among the flowers there was sure to be another in close attendance. They were beautiful and perfect specimens in the morning, but before the day was over all showed frayed wings to a more or less extent, for the contact with the plants and flowers soon destroys their delicate beauty. The female, however, as is the case with many other species, is more strongly built and better fitted in every way for the longer life before it.

The Lantana bushes were not the rendezvous for the Ornithopteras alone, for in fine weather countless numbers of other butterflies disported themselves among the flowers. I am not an enthusiast in butterflies, but when I found all these insects so common and so easily obtained, I very soon produced a suitable net for taking them, a piece of Lawyer Cane furnishing an excellent rim. As before mentioned, the genus *Papilio* were the most numerous. Seven species were noted. The commonest is *P. sarpedon*, with its blue-marked and black-bordered wings; then *P. lycaon* is marked similarly to the preceding species, but the colouring instead of being blue is yellowish. These two species have but the rudiments of the tails so well defined in the others. *P. macleayanus* is a very quick and energetic butterfly. Its prevailing colour is green, with a broad black edge to the wings, furnished with a row of whitish spots. *P. anactus* is black and white, with some reddish colouring on the hind wing. A butterfly much prized in collections is *P. leosthenes*, but it is somewhat rare; the ground colour is creamish, while narrow black stripes run up and down each wing, the posterior pair of which terminates in a long-pointed and very delicate tail. Another species rare in the district is *P. capaneus*, a large black insect, relieved by a narrow yellowish band on the upper wings and a broader patch on the lower, bordered on the outside with bluish and red markings; the male is somewhat smaller than the female.

The exotic butterfly, *Danaus erippus*, is a very common object out in the fields, where in company with its smaller congener, *D. petilia*, it is seen flying about among the grass and small plants, and occasionally the rarer species, *D. hamata*, with the pretty blue-spotted wings, comes along. The family Hesperidæ, or

Skippers, is well represented. The leading member in beauty is *Euschemon rafflesia*, which is very attractive to the eye; another is about the same size, but coloured dull blue, with a sooty-black border to the wings. Two smaller brownish species frequent the long grass, and dart away with lightning-like rapidity as you disturb them from their cover. The last butterfly I shall mention is the large white and silver-coloured *Charaxes sempronius*, which I have seen busily feeding on the sweet juice oozing from damaged fruit in the orchard. Moths are equally as plentiful as butterflies, especially the Hawk Moths. I captured specimens of *Chaerocampa celerio* and others hovering about the verbena flowers in the garden. The Agaristidæ are represented by three or four species, the most noticeable of which is the many-coloured *Agarista agricola*. While the Lepidoptera are so common, members of the Coleoptera, or beetle tribe, are very scarce indeed.

I shall now pass on to the birds, which are truly the life and glory of the scrub. I did not note above seventy-eight species, but the majority are true denizens of the semi-tropical growths. A few species, however, such as Magpies, Quail, &c., are essentially birds of the open field, while others are seemingly impartial, and are found usually in the second growth, or in the outskirts of the scrub itself. The Black-backed Magpie, *Gymnorhina tibicen*, and the Pied Crow-Shrike, *Strepera graculina*, are plentiful in the open country. The latter is of a retiring disposition, however, but is very noisy; a party of four or five will make the place re-echo with their wild calls. The Butcher-bird, *Cracticus destructor*, is everywhere admired as a beautiful songster, but here it is eclipsed by the Black-throated species, *C. nigrigularis*, which is, without a doubt, in its striking plumage of black and white, the handsomest of the family. The Dollar-bird, *Eurystomus australis*, and the Drongo, *Chibia bracteata*, are both very noisy birds, frequenting the outskirts of the scrub. The Laughing Jackass, *Dacelo gigas*, and the Sacred Kingfisher, *Halcyon sanctus*, are as common as in southern districts; but there is the addition here of the Forest Kingfisher, *H. macleayi*, which is a beautiful bird. It is of a bright blue colour, with the under surface white and two large white spots showing on the wings as it flies. The male is distinguished by having a band of white around its neck, but in the female the collar is not complete. A fourth species, the Azure, *Alcyon azurea*, is found along the creeks. The Forest Kingfisher selects the unique position of a white-ant's nest for its own domicile; it tunnels a hole into the side, and deposits five or six eggs in a cavity excavated in the centre. The Sacred Kingfisher, and even the Jackass, have been known to use the ants' nests similarly. On one occasion I observed a Forest Kingfisher nesting in a "calabash" or clump of Stagorns, for in the soft brown fibrous growth of rootlets it no doubt found a cosy retreat.

In another large "calabash" a Jackass had reared its young for several seasons.

The family of Superb Warblers or Wrens is represented by three species, lively little creatures, which are found wherever there is cover. But the ordinary Blue Wren, *Malurus cyaneus*, is outshone by the *M. melanocephalus*, which, instead of blue, dons a red plumage. Both species are common, but what a contrast in colouring for two birds of one family! The latter builds its nest in long grass, and the eggs, three in number, are spotted with a dull chocolate colour. A distinguishing mark to the nest is that the dry skeleton bracts enveloping the fruit of the Cape Gooseberry, which grows plentifully about, are invariably found ornamenting the exterior. One male bird of this wren I shot in the interesting stage of changing its immature brownish coat for the brilliant plumage of the adult male, which change is supposed to take place when the bird is three seasons old; then the black colouring begins to show through the drab of the head and under parts, while the red feathers appear in the back. The third species, *Malurus lamberti*, is somewhat scarce. The Grass Warbler, *Cisticola exilis*, is in great numbers, and its nest is often found in the tall weeds. The Finch, *Munia castaneithorax*, is called the "Barley-bird," for in the season it congregates and strips cereal crops. Its nest is a rough structure, usually placed in the tops of "blady" grass, which grows in patches near water. The Dicæum and the Zosterops were also noted. I saw several nests of the latter in fruit trees, and with one exception they contained two eggs each. A nest of the Dicæum was found with the unusual clutch of four eggs.

In several parts of my paper I have mentioned second growth scrub, and, of course, I refer to patches that have sprung up in the clearings, and have been allowed to stand for shade or other purposes. One bird does not, apparently, patronize any other place—the Fig-bird, *Sphecotheres maxillaris*, I refer to, which lives and breeds in several of the larger patches, never leaving them except on a foraging expedition. For its nesting-place it chooses a horizontal fork at the tip of a branch, and builds the nest of tough wiry tendrils and small sticks; the three eggs can be seen from below showing through the structure. The Fig-bird breeds in bands of a dozen or so, and several pairs of the Oriole, *Oriolus viridis*, are generally in the company.

The Pheasant Coucal, *Centropus phasianus*, is a phenomenal bird, approaching in relation nearest the Cuckoo family; but it builds a rough nest for itself in cover near the ground, and lays four dull whitish eggs. The bird frequents patches of bracken, fern, and other undergrowth, and is well known by its deep, resounding guttural call, which can be heard a great way off. It is a very awkward creature, having a long thin body, which, with the large tail, is black, while the wings are mottled brownish.

The bird possesses little wing power, and depends on its legs for safety, but if startled will hop up into a bush. It is given to paying visits to the farmers' poultry yards and demolishing the fowls' eggs. Three species of Cuckoos are noted. The Koel, *Eudynamis flindersi*, a large species, about 18 inches in length, is called the "Cooee-bird," from the nature of the male bird's whistle; but the female has quite a different call. The mature male bird is of a beautiful shining black, set off with carmine eyes. Its wearisome "coo-ee" (the second part of the call a half-tone higher than the first) is frequently heard during the night-time. The Fan-tailed, *Cacomantis flabelliformis*, and the Brush Cuckoos, *C. variolosus*, are plentiful. There is sometimes difficulty with collectors in separating these two species, but where both are common, as here, there is no trouble whatever in distinguishing their different calls; and when the birds are in hand it is noticed that the former has the tail feathers conspicuously scalloped with white on both the outer and inner webs, while with the latter only the inner webs are marked.

The Black Cockatoo, *Calyptorhynchus funereus*, and also the Banksian, *C. banksi*, are often seen flying over; the commonest parrakeet is the Crimson, *Platycercus elegans*, the well-known Rosella, *P. eximius*, being considered rare. But the district is rich in Lorikeets; the Blue-bellied, *Trichoglossus multicolor*, is very destructive to the ripening maize crops, while the Scaly-breasted, *Psittentulus chlorolepidotus*, feeds in numbers in the Bean and other flowering trees. Although I did not procure specimens of the little Red-faced Fig Parrot, *Cyclopsittacus coxeni*, yet the scrub is its home; it feeds exclusively on the fruit of the *Ficus australis*, and from its diminutive size would be very difficult to see so high up among the broad leaves.

(To be continued.)

MAGPIES.—Some little time ago Mr. D. Best read an interesting paper before our Club on the magpie, and in it the question was raised as to the reason for magpies having developed the habit of flying at persons who happen to be in the vicinity of their nests. Mr. A. F. Thiele, of Doncaster, a member of the Club, informs me that he has taken particular notice of the habits of magpies, and says that his observations, extending over a number of years, lead him to conclude that a nest having once been robbed, the parent birds develop the habit referred to, and in support of this states that in his orchard there is a large eucalyptus tree, in which for years past a pair of magpies have regularly nested, but, owing to the height of the tree, the nests have not been molested, the birds flying quietly away if persons approach close to the tree.—C. FRENCH, JUN.

DESCRIPTION OF THE NEST AND EGGS OF THE
PAINTED HONEY-EATER, *ENTOMOPHILA PICTA*,
GOULD.

BY ALFRED J. NORTH, C.M.Z.S.,
Ornithologist, Australian Museum, Sydney.

THIS Honey-eater is one of the most beautiful, and undoubtedly the rarest, species of the family Meliphagidæ found in Australia. It is an inhabitant of the inland portions of New South Wales, but during a residence of a quarter of a century in the western district of the colony, the stronghold of this species, only six examples were noted by that acute observer, the late Mr. K. H. Bennett. In a period of fourteen years two specimens in the flesh have been received by the Trustees of the Australian Museum—one obtained near Dubbo, and the other at Uralla, in the New England district.

Gould found a nest of this Honey-eater over sixty years ago, on the 5th September, containing two nearly fledged young, but hitherto, so far as I am aware, the eggs of this species have not been taken.

A nest of this species procured on the 23rd December, 1899, by Dr. George Hurst, at White Rock, near Bathurst, New South Wales, and presented by him to the Trustees of the Australian Museum, is one of the most flimsy specimens of bird architecture I have seen. It is cup-shaped, and formed almost entirely of fine yellowish-brown fibrous rootlets, with a very slight addition of spider's web. The sides of it are attached to the thin, drooping, thread-like leaves of a Casuarina, and it is so loosely constructed that daylight is as easily seen through it as the interspaces of the surrounding leaves. Externally it measures $2\frac{1}{2}$ inches in diameter by 2 inches in depth, the inner cup measuring $2\frac{1}{4}$ inches in diameter by $1\frac{3}{4}$ inches in depth. It was built in a tree on the bank of the Macquarie River at a height of 30 feet from the ground, and contained two eggs, one slightly incubated, the other addled. The eggs are oval in form, and somewhat compressed towards the smaller end, the shell being close-grained and its surface smooth and almost lustreless. The ground colour is a pale salmon-red, which is thickly freckled and spotted with darker shades of red. In one specimen the ground colour is slightly darker, and the markings larger and confluent on the thicker end, where they form a broken zone, a few large spots also being intermingled with the smaller ones on the thinner end. On the other specimen the markings are slightly larger on the thicker end, where also a few almost obsolete spots of dull violet-grey are visible. Length (A), 0.78 x 0.59 inch; (B), 0.77 x 0.57 inch. These eggs resemble in colour a variety of those of the Yellow-faced Honey-eater, *Ptilotis chrysops*, Latham.

[Dr. Hurst had never observed the Painted Honey-eater in the Bathurst district prior to finding the above described nest and eggs.]

THE TASMANIAN EMU.—The question was raised in the October *Naturalist* (page 115) as to whether any examples of the extinct Tasmanian Emu exist in museums. Although this emu is now extinct in Tasmania, not very long ago it existed in great numbers. Lycett, in his work on Australia, published in 1824, makes many references to it, such as “in quantities between Hobart and Launceston and at Schouten Island, affording most excellent sport,” and again as “being in vast flocks,” together with kangaroos. In 1843 Lady Franklin had two in a paddock at Government House, Hobart, which in all probability were some of the last of the race. Before I left London in 1840 I saw two specimens in the British Museum, then at Marlborough House, labelled “Van Diemen’s Land,” and I was much interested in 1892, when visiting the British Museum at South Kensington, to which all the specimens from the other building had been transferred, to see, as I suppose, the same birds, with the same locality, “Van Diemen’s Land”; but before I left London in 1895 they had been replaced by a much finer bird from Queensland. I have no doubt but that the two birds I refer to were genuine Tasmanian birds, being much smaller than those usually seen in Victoria and New South Wales. On a recent visit to the Hobart Museum I mentioned the matter to the curator, hoping that an effort might be made to obtain them for that museum.—T. J.

FOSTER PARENTS TO THE BRONZE CUCKOO.—The following two species have not, I think, been previously recorded as foster parents of the Bronze Cuckoo, *Chalcococcyx plagosus*, Lath. Mr. J. A. Hill, writing to me from Kewell, says:—“In 1886 I watched a pair of Chestnut-rumped Tits, *Acanthiza uropygialis*, Gld., build their nest within a hole in a box tree (eucalypt) at about six feet from the ground. I was pleased to feel an egg, and retired at once; but finding the tits did not return to their nest I concluded they had deserted it, and with a spoon I withdrew the egg. Much to my surprise it proved to be one of the Bronze Cuckoo. The hole in the tree was so small that the tits alone could go through, and the cuckoo could not have done other than drop it from the entrance of the nest to the bottom. The tits deserted their house.” Supposing the cuckoo’s egg had matured, how would the young cuckoo have got out? Young cuckoos always considerably expand the nest entrance; but in this case the double entrance would have foiled it, as one was of growing wood. I should not think the tits left their nest because they anticipated that the young bird would be a prisoner, but rather that an offence had been committed against them. The second case which has come under my notice is that of an egg of the same species of cuckoo being laid in the nest of the Red-capped Robin, *Petræca goodenovii*, V. & H.—ROBERT HALL. 8th October, 1900.

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The Author of each article is responsible for the facts and opinions recorded.

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1900.

Field Naturalists' Club of Victoria.

ROOMS—ROYAL SOCIETY'S HALL, VICTORIA ST., MELBOURNE.

BUSINESS PAPER FOR MONTHLY MEETING.

Monday, 10th December, 1900, at Eight p m.

1. Correspondence and Reports.
2. Election of Members.

	Proposer.	Seconder.
Mr. F. W. Scott 2 Miller Street, Richmond.	R. Hall	D. Le Souef, C.M.Z.S.
Miss Stead "The Nook," Porter St., Prahran.	D. M'Alpine	Geo. Coghill

3. Nominations for Membership.

Members making nominations will oblige by handing the full name and address to Hon. Secretary.

4. General Business.
5. Reading of Papers and Discussions thereon.

(Authors are requested to hand in a brief resume of their papers to the Secretary.)

1. By Mr. R. Hall, "Ornithological Notes."
2. By Mr. D. Le Souef, C.M.Z.S., "Notes of a Visit to Riverina," with lantern illustrations.
3. By Mr. J. G. Luehmann, F.L.S., "Description of a New Lobelia from Murchison River, Western Australia."

6. Reading of Natural History Notes.

Members who may note any unusual occurrence, or see anything of interest in Foreign or Colonial papers, are requested to inform the Secretary of the same that he may arrange for their bringing them before the meeting; such notes should, however, be brief.

7. Exhibition of Specimens and Conversazione.

Members exhibiting specimens are requested to furnish the Hon. Secretary with written particulars of their Exhibits for record in Minutes and *Naturalist*.

* EXCURSIONS. *

SATURDAY, 15TH DECEMBER.—Port Phillip Bay. Leader, Mr. J. Gabriel. Dredging. Particulars at monthly meeting.

SATURDAY, 12TH JANUARY.—East Kew, *via* Deepdene. Leader, Mr. O. A. Sayce. Meet at Prince's Bridge Station at 1.55 p.m. Pond Life.

THE
Victorian Naturalist.

VOL. XVII.—No. 8. DECEMBER 6, 1900.

No. 204.

FIELD NATURALISTS' CLUB OF VICTORIA.

THE ordinary monthly meeting of the Club was held at the Royal Society's Hall on Monday, 19th November, 1900. The president, Mr. J. Shephard, occupied the chair, and about 30 members were present.

REPORTS.

A report of the excursion to Ringwood (altered from Bayswater) on Saturday, 20th October, was given by Messrs. G. A. Kearthland and C. French, jun., the latter having acted as leader in the unavoidable absence of Mr. J. A. Kershaw. A fair number of plants were noticed in bloom, among them being *Caladenia congesta*, *Utricularia dichotoma*, and *Thelymitra aristata*, the latter with twenty-five flowers on the stem. Several interesting ornithological observations were made and photographs of nesting operations taken.

A report of the excursion to Frankston on Tuesday, 6th November, was read by Mr. J. A. Kershaw, in the absence of the leader, Mr. C. French, F.L.S. Flowering plants were numerous, perhaps the most interesting being *Comesperma calymega*. Insects were fairly numerous, especially the smaller Lepidoptera.

A general report of the "camp-out" at Healesville, from Saturday till Monday, 10th to 12th November, was read by Mr. F. G. A. Barnard, who stated that a most enjoyable time had been spent by the party, and a fairly complete biological survey of the district had been made.

The hon. librarian reported the receipt of the following donations to the library :—"The Macleay Memorial Volume," from the Linnean Society of New South Wales; "Transactions of New Zealand Institute," vols. xvii., xix., and xxxii., and "Manual of New Zealand Coleoptera," parts 2 and 3, from Mr. S. W. Fulton; and "Western Australian Year-Book," 1898-9, from Dr. A. Morrison, to each of whom the thanks of the Club were accorded for their donations.

ELECTION OF MEMBERS.

On a ballot being taken, Dr. Sutton, Rathdown-street, Carlton, was elected an ordinary, and Mr. F. L. Billingham, National Bank, Alexandra, a country member.

PAPERS READ.

1. By Mr. G. A. Kearthland, entitled "On the Collared Plain Wanderer."

The author described the habits of a pair of birds which had attempted to breed in captivity.

Messrs. R. Hall and D. Le Souëf thought the observations recorded were most interesting.

2. By Messrs. S. W. Fulton and F. E. Grant, entitled "Note on Occurrence of a European Shore Crab in Port Phillip Bay."

The authors stated that in working at the Crustacea of Port Phillip they had obtained numerous specimens of a crab which had been identified as *Carcinus mœnas*, Leach, common in European waters, and raised the question as to how the crab had been introduced into Victoria.

Messrs. T. S. Hall, O. A. Sayce, H. Gunderson, J. A. Kershaw, and the president joined in the discussion that followed.

3. By Mr. D. Le Souëf, "Descriptions of Some North Australian Birds' Eggs."

The author described the eggs of the Pale-headed Shrike-Thrush, the Cape York Thickhead, the Little Scrub-Wren, and a sub-species of the Blue-bellied Lorikeet.

Messrs. A. J. Campbell, G. A. Kearnland, and R. Hall discussed the paper.

NATURAL HISTORY NOTES.

Mr. C. J. Gabriel read a note on a nest exhibited of the Restless Fly-catcher, built of wool, whereas usually they are constructed of grass, and occasionally bark, held together with hair.

Mr. G. A. Kearnland reported an instance in Queensland of hybrids between the Scrub Turkey, *Talegallus lathamii*, and the domestic fowl.

EXHIBITS.

By Mr. A. J. Campbell.—*Sericornis gularis*, bird and eggs, from Kent Group.

By Mr. C. French, jun.—*Epacris impressa*, double red-flowering variety, collected by Mr. G. Lyell at Gisborne.

By Mr. J. Gabriel.—Eggs of Crimson-bellied Parrakeet, Restless Fly-catcher, and nest of Pomatorhinus, containing at least two species, collected at St. Arnaud.

By Mr. C. J. Gabriel.—Shells of *Chiton articulata*, from Gulf of California, and *Nucula grayii*, from Port Phillip Bay; also nest of Restless Fly-catcher, built of wool.

By Messrs. Fulton and Grant.—Crabs, in illustration of paper.

By Mr. T. S. Hall, M.A.—Land Mollusca, from Healesville—*Cystopelta petterdi*, Tate, *Endodonta subdepressa*, Brazier—identified by Mr. C. Hedley; also Crabs from within Mussel shells from Anderson's Inlet, per Mr. W. H. Ferguson.

By Mr. D. Le Souëf, C.M.Z.S.—Eggs described in paper—*Collyriocinclla pallidirostris*, *Pachycephala peninsulæ*, *Sericornis minimis*, *Trichoglossus novæ-hollandiæ*, sub-sp. *septentrionalis*.

By Mr. A. Mattingley.—Photographs of Healesville camp-out.

By Mr. F. Pitcher.—Some Western Australian everlasting flowers, including an *Helipterum* probably new to science.

By Mr. J. Shephard.—Photographs of scenes at camp-out.

By Mr. H. T. Tisdall.—43 dried specimens of plants from Healesville camp-out.

By Mr. C. Walter.—*Epacris hamiltoni*, Maiden and Betche, new to science, collected by Mr. A. A. Hamilton, Blackheath, N.S.W.; *Gompholobium huegelii*, Bentham, var. *d'altoni*, C. Walter—flowers with bright red petals, new variety, collected by Miss H. D'Alton, Glenbowrie, Grampians; *Capsella pilosula*, F. v. M., from new locality, Coast Hills, Port Fairy, collected by H. B. Williamson, Hawkesdale.

After the usual conversazione the meeting terminated.

THE "CAMP-OUT" AT MAROONDAH WEIR.

IN Victoria November is, no doubt, the best all-round month for the field naturalist, and, encouraged by the reports of the *Lerderberg* "camp-out" in the corresponding month of 1899, it was resolved this year to carry out a similar excursion in the Healesville district, about forty miles E.N.E. from Melbourne. The district being one of the gathering grounds of Melbourne's water supply, a large tract of country is practically in a state of nature and under the control of the Metropolitan Board of Works. Permission to explore the reserve and make use of the regular camping ground was readily granted by the Board's officers, and accordingly on Friday, 9th November, three of the party left town by the first train with the camping outfit, which was generously placed at the disposal of the Club by our fellow-member, Mr. A. Mattingley, who also arranged all details as to provisions and cartage. Other members proceeded by the midday and evening trains, so that the muster at supper-time amounted to thirteen, which was augmented by another arrival the next evening.

The spot selected for the camp was a sheltered nook on the bank of the Watts River, a little below the weir of the Maroondah aqueduct, about four miles and a half from Healesville. Here were erected a dining marquee and two sleeping tents, so that the party formed an imposing encampment. The first night in camp to many proved sleepless. Perhaps the rushing noise of the Watts close by sounded too much like rain, or the melancholy call of the Boobook Owls—"more-poke," "more-poke"—was responsible for this. However, all were early astir on Saturday morning, when there was every prospect of a splendid day. After breakfast nearly all started off on the track to the Mathinna Falls, nearly three miles away, on the eastern slope of Mt. Monda, which overlooked the camp. Soon after

crossing a little stream known as Contentment Creek, the track led up a spur, and became somewhat steep. Numerous fallen branches and logs lay alongside the track, and collectors were soon at work turning them over, with the hope of obtaining certain kinds of beetles, land planarians, peripatus, and other forms of cryptozoic life which frequent such situations; and they were not unrewarded, for a good variety of planarians was obtained, as well as several specimens of peripatus. The path was bordered with the pink flowers of *Tetradlea ciliata*, with here and there bushes of *Pultenaea muelleri*, with its deep yellow flowers. Higher up the delicate yellow flowers of *Eriostemon correfolius* were noted, while the universal *Goodenia ovata* was very fine. The Hill Tree Fern, *Alsophila australis*, now became more frequent, and a fine specimen with a triple-stemmed trunk was noticed near the track. After a somewhat level portion another steep pinch occurred, where flying about in the sunshine were numbers of the pretty butterfly *Xenica hobartia*, of which specimens were secured. The Bracken Fern, *Pteris aquilina*, on this spur was very high and dense, and prevented much exploration of the hillside. A few bushes of *Prostanthera melissifolia*, with a few expanded purple flowers were seen, while among some rocks grew the creeping Fan-leaved Fern, *Asplenium flabellifolium*. Arrived at the falls, a pretty sight met our view. Here was a beautiful fern gully, full of the usual vegetation, with the water of Contentment Creek dashing down the rugged rocks and disappearing in the depths below. Photographs of the falls were taken, and some time was spent in the search for the lower forms of animal life among the moist and decaying vegetable matter. On a subsequent visit to this locality about eighteen ferns were identified, among them being *Lomaria lanceolata*, *L. fluviatilis*, *Aspidium capense*, *Asplenium bulbiferum*, and *Gleichenia flabellata*. The Batwing Fern, *Pteris incisa*, was very luxuriant, sending up fronds four to five feet high. The curious lycopod, *Tmesipteris tannensis*, was found in fruit on the tree-fern trunks, where were also noticed the orchids *Chiloglottis gunnii* and *Corysanthes pruinosa*, the former being in flower. A singular nodular fungus was growing on many of the tree trunks, which yielded abundance of dense black spores on drying.

Some members scrambled down a hundred feet or so to the lower falls, which are the prettier sight of the two, and below which is a deep gorge full of vegetation of all kinds. The Sassafras, *Atherosperma moschatum*, had just finished flowering, and was entwined with the stems of the Supplejack, *Tecoma australis*, which was noticed in bloom lower down. Another climber, *Clematis aristata*, had made use of the bracken in places, and was conspicuous with its large creamy flowers. Returning to camp, the midday meal was disposed of, after which the members dis-

persed in small companies in different directions, returning at sundown for a well-earned tea. The necessary washing-up being concluded, the various collectors brought out their specimens to compare notes, or examine with the microscope, or if butterflies to set, or birds to skin, or plants to press, either of which was easily accomplished by the excellent light from gas generated in the marquee. Then an early retirement was made, in view of more work on the morrow.

Next morning (Sunday) was equally fine, and after breakfast four members started off for Mt. Juliet, two for Fernshaw, while others remained at camp, or explored the nearer neighbourhood. The Mt. Juliet party were out all day, and returned home thoroughly satisfied with their hard work. Crossing the Watts at the weir a track up a spur was followed to the Fernshaw road. On the way fine specimens of the orchid *Calochilus robertsoni*, with its singular fringed labellum, were obtained. On the roadside *Astrotricha ledifolia* grew in abundance. Further on fine patches of the Ti-trees *Leptospermum scoparium* and *L. lanigerum* were in full bloom, but yielded little to the entomologists. A few specimens of the mountain butterfly, *Epinephile abeona*, were seen flying about the blackberry bushes, now very abundant on the roadside, and captured, but the beautiful species *Papilio macleayanus* was not to be caught. We were now facing the steep front of Mt. Juliet, but little did we think that it would take almost four hours before we reached its summit, some 3,000 feet above us, and less than three miles away. The track was not so well defined as that on Mt. Monda, and seemed to lead up through a greater variety of vegetation; but perhaps it was in watching to see that we did not go wrong that so many plants were noticed.

Passing the former site of the forester's house, the purple Foxglove was noticed to have made itself quite at home, and might fairly be added to the list of introduced plants. The little violet, *Viola hederacea*, the little pink orchid *Caladenia carnea*, and *Tetratheca ciliata*, with its flowers varying from delicate pink to deep mauve, bordered our path for two-thirds of the way up. The pure white flowers of *Stellaria flaccida* appeared everywhere in the scrub, while here and there the bushes and ferns were bound together with the twining stems of *Comesperma volubile*, bearing its delicate blue flowers. *Pimelea axiflora*, and the Native Laburnum, *Goodia lotifolia*, were fairly plentiful. *Panax*, *Sambucus*, *Prostanthera melissifolia*, *Eriostemon correfolius*, and the Kangaroo Apple, *Solanum aviculare*, were noticed; also *Persoonia arborea* and *Zieria smithii*, but the former was not in flower. As our path was very steep, and we could not see the top of Mt. Juliet, we were glad of the excuse every now and again to turn round and compare the height we had attained with that of Mt. Monda, which was visible through the heavy timber of the

mountain side. At last we reached a large tree which bore the somewhat superfluous legend "To Mt. Juliet;" had it directed us to the spring which is said to exist somewhere thereabouts we should have been better pleased. The mount was now steeper than ever, so we decided to leave coats and baggage behind, so as to lighten our work for the last 1,000 feet. Near here we found *Veronica notabilis* and several composites.

Shortly after leaving our halting place the track which zig-zagged up the mountain face became almost obliterated by fallen timber or the washing away of the soil, and there was also a thick growth of heavy grass, which made walking very slippery, and as the surface was now very rocky, progress was slow. At last we got among the dead trees which form conspicuous objects from the Fernshaw road, and were able to get glimpses of Healesville far below us. The vegetation became scarcer as we ascended until at length we got up to the lower edge of the topmost plateau, when walking became easier. Now we began to realize that our efforts were not to be unrewarded. At last Mt. Monda was below us, also Mt. Riddell, the sugarloaf peak which rises at the back of Gracedale House. With a final effort we made for the trigonometrical survey cairn, now visible on the summit, passing on the way some fine specimens of the Silver Wattle, *Acacia dealbata*, which were still bearing a wealth of yellow bloom, though just past its prime; while flying about them and some Blackwoods, *Acacia melanoxylon*, were the butterflies *Pyrameis itea*, *Papilio macleayanus*, and *Epinephile abeona*.

Arrived at the cairn, 3,650 feet above the sea, a magnificent panorama was spread out before us, with little to interrupt the view, as all the large trees had been felled years before, at the time of the survey, and we were able to overlook those growing lower down. Far below us could be seen the former site of Fernshaw; here and there portions of the road over the Black Spur could be made out, and traced across the Dividing Range to Marysville, which was just visible. Stretching away due north was the valley of the Acheron, with the Cathedral Peak near Taggerty standing prominently up; round by the east, range after range extended to the horizon. To the south our view was somewhat cut off by a high range towards Warburton, but away to the south-west, over Mt. Riddell, the Dandenongs looked like a small hill, with Lilydale at the foot. Unfortunately the western horizon was obscured by haze, so that none of the conspicuous landmarks of Melbourne could be made out, though one of the party had burdened himself with a heavy field glass. The locality of our last extended excursion, Plenty Ranges and Wallaby Creek, was clearly visible, while nearer at hand were Mt. St. Leonard (3,300 feet) and Mt. Monda (2,974 feet), the latter about nine miles away as the crow flies.

Mt. Juliet is the centre of one of the largest areas of trap rocks in Victoria. This includes Mt. Monda, but does not extend to Mt. St. Leonard (only three miles further), which is in a granitic area extending eastward along the Dividing Range to Mt. Arnold.

Though within the ordinary winter snow limit, we were somewhat disappointed with the vegetation on the top of Mt. Juliet, expecting to find something more Alpine than we did. Even *Grevillea alpina*, so plentiful at Mt. Disappointment and Wallaby Creek, and also at Mt. Corranwarrabul (Dandenong Ranges), was not noticed at all during the three days' excursions. Some stunted gum-trees, which may have been *Eucalyptus gunnii*, were noticed, but few herbaceous plants were seen. Unfortunately, we could not spend much time on the summit, and having been re-invigorated by the charming atmosphere of the mount, we turned our backs on the cairn and commenced the descent to the marked tree, which was safely accomplished after numerous slips and slides. It was now well on in the afternoon, but though our appetites were keen, for want of water our luncheon seemed hard to swallow, so we put it away until a better opportunity occurred. Descending the mountain did not require so much exertion as the ascent, and had the disadvantage of allowing less time to look about; however, numerous specimens were picked, and duly handed over to our botanist on return to camp. At last we reached the Mosquito Creek, and were able to quench our thirst, which fortunately had not been aggravated by a hot wind, the weather having been delightful all day. Returning to the main road, we set off in the direction of what was once Fernshaw, distant about a mile, and spent some little time on the bank of the Watts, intending to make back to camp alongside the river; but the growth of bracken, blackberries, &c., proved so thick that we had to take to the road again, and so back by our track of the morning to the Maroondah weir and the camp close by. The evening was again spent in setting butterflies, skinning birds, or endeavouring to make out our botanical treasures by means of the "Key," and so the time rapidly passed until bedtime.

The early morning of Monday was rather cloudy, but after breakfast the weather was all that could be desired. Parties went off in various directions—one along the pipe-track or aqueduct as far as the first tunnel, another to the Mathinna Falls, another down the Watts Valley, and so on, re-assembling at mid-day for our last meal at camp. After dinner each began to pack up his belongings, and when the vehicle arrived and the luggage had been placed on it the load seemed almost too much for the one horse sent, especially after the camp equipments had been added to it. Another hour, and we bade adieu to a spot where many pleasant hours had been spent, all agreeing in considering it one of the most enjoyable short camps yet held by the Club, and one

in which each individual had worked for the good of the whole party, thus making everything run smoothly. Much of this success was undoubtedly due to Mr. Mattingley, whose knowledge of camping out proved invaluable. The members comprising the party were:—Messrs. A. Campbell, jun., G. Coghill, R. H. Cummins, J. F. Haase, T. S. Hall, J. A. Kershaw, G. A. Keartland, J. M'Caw, O. A. Sayce, J. Shephard, H. T. Tisdall, and A. Wallen, with A. Mattingley and F. G. A. Barnard as co-leaders.

I am indebted to members for the following reports on their various branches:—

ORNITHOLOGY, &c.—Mr. G. A. Keartland reports that, owing to the density of the scrub and several minor reasons, the ornithologists of the party did very little collecting, though making some interesting observations. In addition to those birds which are found nearer home, the Gang Gang Cockatoos were fairly numerous. Black Cockatoos were seen, and at least two pairs of Sulphur-crested Cockatoos behaved in a manner which led to the belief that their nests were near. Close to camp a Rose-breasted Robin's nest was seen, and a pair of Spine-billed Honey-eaters made such vigorous attacks on every small bird approaching the trees over the tent as to leave it an open question whether they were guarding our domicile or their own. A Laughing Jackass daily perched himself on a branch close to the camp fire, and judging from his grave manner and attention to details was studying the art of cookery. Lewin's Honey-eater and Rufous Fantails were noted near the stream, while in the scrub many beautiful specimens of *Malurus cyaneus* were found. On the hillsides Pennant's Parrakeets, Yellow-breasted Robins, White-throated Thickheads, Shining Fly-catchers, and Brush Cuckoos were fairly numerous; signs of the Lyre-bird were seen in the fern gullies. Altogether about sixty species of birds were observed, but owing to the difficulty in recovering birds when shot they were seldom molested.

Several nests of the Ring-tailed Opossum were found close to the camp, and the dead bodies of two of the animals, just killed, were found by the early members of the party whilst pitching the camp. An Echidna was seen crossing the track near camp, and quickly found its way into a box, in which it was forwarded to the Zoological Gardens. Although not seen, there was ample evidence of the presence of the Wallaby, Kangaroo, Wombat, and Native Bear in the locality. No snakes were seen during the outing.

CRUSTACEA.—Mr. O. A. Sayce reports that specimens of the Freshwater Crayfish, *Astacopsis serratus*, var. *yarraensis*, the terrestrial Amphipod *Talitrus sylvaticus*, and two freshwater Amphipods belonging to the genera *Hyaella* and *Atyloides*, were obtained.

PROTRACHEATA.—Several specimens of *Peripatus leuckartii* were obtained.

ENTOMOLOGY.—Mr. J. A. Kershaw, F.E.S., reports that insects of all kinds were scarce, owing to a great extent to our visit being a month or six weeks too early, but more might have been done had we not been compelled to confine our search mainly to the beaten tracks, owing to the thick undergrowth. A visit to the same district about the end of December or early in January would, I am sure, prove a profitable one to the entomologist. Of the Lepidoptera, recently emerged specimens of *Papilio macleayanus* were seen occasionally, but generally in places where it was impossible to get near them, specimens being met with both in the valleys and at the summits of the highest hills. *Epinephile abeona* was also met with and some specimens captured. *Pyrameis kershawi* and *P. itea* were, as usual, common everywhere, while the beautiful little *Xenica hobartia* was found plentifully on the side of Mt. Monda. Examples of *Idiodes apicata*, *Nearcha buffalaria*, and *Hydriomena correlata* were also taken in the vicinity of the camp. Most of the Micros. were well-known species, the following being amongst those noticed:—*Cacoecia polygraphana*, *Tortrix subfurcatana*, *Dipterina rupicolana*, *Bondia dissolutana*, *Palparia euryphanella*, *P. uncinella*, *Zonopetala clerota*, *Heliocausta limbata*, *Hoplitica absumptella*, *Philobota chrysopotama*, *P. interlineatella*, *Phlocopola confusella*, *Eulechria xylopterella*, *Peltophora atricollis*, *Leistomorpha ochrocausta*, *Ocystola paulinella*, *O. malacella*, *Coesyra parvula*, *Pleurota brevivittella*. Several larvæ were noticed, but with the exception of one belonging to the Geometridæ, which was taken, were all common. The Coleoptera were scarce, although diligent search was made under fallen logs, stripping bark, shaking, &c. *Xylonychus eucalypti* was seen on summit of Mt. Juliet. Three species of Buprestidæ were shaken from flowering shrubs—namely, *Stigmodera bicincta*, *Anthracina cruenta*, and *Cisseis acuducta*. Of the Longicorns, *Stenoderus suturalis*, *Tritocosmia paradoxa*, and *Bethelium significum* were taken. Several species of Carabidæ, Curculionidæ, Cleridæ, &c., were also noticed, and some taken, but all being well known need not be specially mentioned. Of the remaining orders nothing of particular interest was found.

MOLLUSCA.—Mr. T. S. Hall, M.A., reports that the following land Mollusca were collected and have been identified by Mr. C. Hedley:—*Cystopelta petterdi*, Tate; *Chloritis brevipila*, Pfeiffer; *Endodonta subdepressa*, Brazier; and a species of Rhytida which has not been determined.

VERMES.—Messrs. J. A. Kershaw and R. H. Cummins report that specimens of the Nemertine *Geonemertes australiensis*, and of the Planarians *Geoplana sanguinea*, *G. sanguinea*, syn. *alba*,

G. hoggii, *G. howittii*, *G. spenceri*, *G. mediolineata*, *G. munda*, *G. adae*, syn. *frosti*, *G. fletcheri*, and *G. sugdeni* were obtained.

BOTANY.—Mr. H. T. Tisdall reports that over sixty dicotyledonous plants were collected in bloom. In addition to those mentioned in the general report the following may be recorded :—*Hedycarya cunninghami*, *Pittosporum bicolor*, *Cryptandra hookeri*, *Loranthus celastroides*, *Pimelea ligustrina*, *P. linifolia*, *Cassinia longifolia*, and *Veronica perfoliata*. *Correa æmula*, *Tetratheca ciliata*, and *Atherosperma moschatum* were obtained in fruit. About a dozen monocotyledonous plants were seen, of which the more noticeable were *Dianella revoluta*, *Xerotes brownii*, *Juncus parviflorus*, *Cladium* (*Gahnia*) *psittocorum*, and *Carex paniculata*. Among Cryptogams were about twenty-two species of ferns, including *Aspidium molle*, *Hymenophyllum nitens*, in addition to those already mentioned ; also *Selaginella preissiana* and *Dawsonia superba*, the tallest Victorian moss.

Though the scientific results of the excursion may not be very striking, it must be borne in mind that country such as we were in requires time to thoroughly explore, as it is impossible in such a short time as three days to get far from the beaten tracks, consequently only the more prominent objects were noticed. There are also other portions of the district where time could be profitably spent—such as the valley of the Graceburn, Contentment Creek above the falls, Morley's Creek, and Myrtle Creek on either side of the Black Spur—and we trust that the advantages of a camp on the Watts will not be forgotten when future excursion lists of the Club are being drawn up, though it may be that before our next visit to the locality the site of our camp will be beneath the waters of the projected Maroondah reservoir. Finally, we have to thank the officers of the Metropolitan Board of Works for granting us the privilege of exploring their reserves, and Mr. Almond, the resident overseer, for his courteous treatment of the party.

F. G. A. BARNARD.

A TRIP TO THE RICHMOND RIVER DISTRICT.

BY A. CAMPBELL, JUN.

PART II.—BUTTERFLIES AND BIRDS—*continued*.

Read before the Field Naturalists' Club of Victoria, 13th August, 1900.)

A noticeable feature of the scrub is the number of trees bearing fruits, which form the staple food of so many of the feathered tribe. A Fig tree is always a sure place to get a bag of birds, and going thither with a good gun one has only to wait and watch for them moving about among the broad leaves. In summer time especially the trees are alive morning and evening with a miscellaneous collection. All are in such a hurry that half-

eaten fruit is dropped or knocked off, and falls to the ground in considerable quantities. The fruits, measuring as they do an inch or more in diameter, cause quite a stir as they speed through the leaves on their downward course, and fall with a sharp smack on the leaf-covered ground. After the report of the gun has died away, all is silence for awhile save for an occasional Regent- or Cat-bird that will dart away into the undergrowth; then presently a large Fruit Pigeon will commence again to flop about among the foliage, and soon the whole congregation are as busy as before with their meal.

The fruit of the Native Tamarind, on which the birds become very fat, ripens in the early spring and summer months. The large Topknot Pigeon, *Lopholæmus antarcticus*, particularly comes in numbers to feast upon the fruit. This bird, the largest of the pigeons, is, however, quite a bird of the air, for in flocks of from six to twelve or fifteen it is seen ever on the move, and rarely appears to settle except at feeding time. The two other large fruit-eating pigeons are the Purple-breasted, *Megaloprepia magnifica*, and the Bald-headed, *Columba leucomela*, but they never leave the precincts of the scrub, and may be considered of all pigeons the most shy and difficult to obtain. The Bald-headed species takes its name from having a white head and neck, the under parts also being white, but the back and wings are black, with a metallic sheen. This bird is the more often seen in parties of six or eight, and is continually moving its quarters, but the Purple-breasted is a strictly local species, and never more than a pair of old birds is seen together. They live and breed about the one spot, and, once you know the place, with a little patience the birds can generally be found. The first idea you get of their proximity is a guttural "quok" up in the tree tops, but the bird remains immovable on its perch, and it is next to impossible to find it, but, if feeding, then you may discern it creeping out along the branches to reach its food; when all within reach has been devoured it will flop clumsily into the next clump of foliage, and this act usually betrays its whereabouts. If a front view of the bird be obtained the rich plum-coloured breast stands out prominently, but otherwise the green of the back and wings and the yellow of the abdomen assimilate with the colour of the surrounding foliage. The various calls of the Fruit-Pigeons, and, in fact, of all the birds in the scrub, are quite a study in themselves, and are somewhat difficult to set down on paper; but the call of the *M. magnifica* is very remarkable, and may be described by the words "wallock-a-woo," uttered in a deep voice. At the first syllable the bird seems to swallow the sound, thus making a peculiar guttural noise. The only call uttered by the *C. leucomela* is a deep "booh." These two pigeons, as well as the Topknot, being very large, are also fine eating, and weigh quite 20 ounces

each when dressed. Information regarding the nidification of the Fruit-Pigeons is somewhat scanty. All the species lay but one egg. The nest of the Purple-breasted species is toughly made of vine tendrils, but all the others are loosely constructed of sticks.

Two smaller Fruit-Pigeons are the Brown or Pheasant-tailed, *Macropygia phasianella*, and the Red-crowned, *Ptilopus swainsoni*, the latter being worthy of a first place for beauty of form and colouring. On its breast is a brilliant splash of orange and light red, shading into yellow on the under tail coverts. The throat and chest are covered with small scale-like feathers of a greyish-green colour, while the back is also green, with mottlings of yellow on the shoulders, and the head is crowned with a lovely patch of pink, set off with orange irides and a flesh-coloured beak. This little bird has several calls; the best known perhaps is a high-pitched "coo" repeated thirteen or fourteen times, beginning slowly and increasing the pace as it proceeds, but another is a sustained "coo-coo," with accent on the first, but cutting the last "coo" short. This little pigeon, as well as the other species, is found very difficult to skin, and it is only with great care that a presentable specimen can be prepared. In spring-time all the birds are very fat, and some have been known to burst asunder on striking the ground after being shot. The Brown Pigeon is of a sombre colour, with a little metallic sheen on the feathers at the back of the neck; it possesses a very large tail, and has a curious habit, when alighting on a branch, of putting it up, then down again, as if endeavouring to balance itself. It is not a shy bird like the other pigeons, for three or four sitting together on a low branch by the roadside may be approached without offering to move; nor does it feed exclusively on fruit. It is no uncommon thing to flush a party off the ground, and as they rise, spreading their large tails, they offer a good mark for a sportsman. The noise made by the Brown Pigeon is very similar to that of the domestic pigeon, and it possesses a "coo-oo" very similar also. There are two other species to mention, but they are both seed-eating birds. The well-known Wonga-Wonga, *Leucosarcia picata*, is often located towards evening by its continuous high-toned "hoo hoo" call, interrupted now and again for a second or two while the bird, no doubt, picks up a morsel; and the sturdy form of the Little Green Pigeon, *Chalcophaps chrysochlora*, is always seen darting out of the scrub at feed-time and off to procure its meal.

This institution of feed-time is well kept, and the regularity with which the various birds make to their accustomed feeding grounds at daybreak and again in the afternoon is very striking. The Red-crowned Fruit-Pigeon and the Regent-bird, *Sericulus melinus*, principally are in the habit of feeding on the black

berries of the Inkweed, *Phytolacca*, which grows so profusely in the clearings when unchecked. The morning's meal is over by about nine o'clock, when numbers of the birds are seen going back into the scrub, and during the heat of the day not one is found outside. But when four o'clock comes round they are all out once more, and feed till dusk. The Little Fruit-Pigeon comes out singly or in pairs, but it is a sight to be remembered to watch a flock of perhaps a dozen Regents, among them being perhaps as many as four of the gorgeous males. The greater number, however, are the drab and grey mottled females and immature males. The female is distinguished by having the forehead and the nape of the neck black. It is generally supposed that the young male is three or four seasons old before it dons its full livery. Occasionally a bird may be noticed that is undergoing the change, and on the head and neck and in the wings the yellow is beginning to appear. In flight the perfect male can be at once distinguished by the golden-yellow patches on the wings.

The Regent-bird belongs to the family of Bower-birds. Its nest is merely a frail platform of sticks situated in a bunch of creepers, and its eggs resemble very much those of the Spotted Bower-bird, *Chlamydodera maculata*, but to the ground colour instead of being greenish is a yellow tint. Apart from the nest, the Regent builds itself a bower or playhouse on the ground, and one in use I had the pleasure of examining was a very neat structure, situated within a circle of Lawyer Cane roots, in a clear space about 4 feet in diameter. The walls of the bower, which were about 8 inches long and 6 inches high, were fixed into a layer or bed consisting of small pieces of stick so tightly trampled down that they were quite compact. This bed was in the form of an oval, measuring 22 inches across one way and 19 inches the other. I may mention that this is quite an unusual addition, for the walls as a rule are fixed into the ground, and a bed of sticks of the dimensions just given is very rarely seen. The first time this bower was noticed three birds, all drab-coloured, were playing in it; each carried an empty snail's shell, and in turn went into the bower, and after bobbing up and down a few times with half-opened wings would toss the shell out over the wall to be picked up by one of the others, which would drop its own for the purpose. The two birds remaining outside performed various antics, brushing the ground with their wings, as a consequence of which the soil within the enclosure of cane roots was quite bare. This exhibition did not last long, for a dog appearing on the scene, unfortunately, scattered the three interesting performers. I visited the bower several times subsequently, but the birds were not at home, and all I noticed was that three or four young purplish-tinted leaves were placed in the centre, and the three shells were laid near. I could see that each day the withering leaves

were replaced by freshly plucked ones. The only calls the Regent-birds have are a single whistle, and a squeaky "whit whit" when alarmed.

The Green Cat-bird, *Aelurædus viridis*, is another member of the Bower-bird family, and is common in the scrub. It takes its name from its loud cat-like "mew-ow" call; towards dusk sometimes several congregate and make a considerable noise. The eggs are of uniform creamy-yellow colour, and the nest is a more substantial structure than the other Bower-birds build. The Cat-bird is very partial to the fruit of the *Canthium* tree; in company with the Regent, the Fig-bird, the Oriole, and sometimes the Satin Bower-bird, *P. violaceus*, it may be seen devouring the small yellow berries, which grow in clusters among the leaves.

Three members of the *Campophaga* family were noticed. The pretty Barred-breasted, *Graucalus lineatus*, and the *Campophaga jardini* are very shy, and rarely leave the tree-tops, but the Black and White, *Lalage leucomelæna*, is a frequenter of the more open country. The Rufous-breasted Shrike-Thrush, *Pinarolestes rufigaster*, is essentially a bird of the scrub, and the Black-faced Flycatcher, *Monarcha carinata*, also. The Large-headed Robin, *Pœcilodryas capito*, and the Large-billed, *Eopsaltria magnirostris*, are seen; the latter takes the place of *E. australis* in our southern districts, but differs from it in having a heavier bill and a brilliant yellow rump, which shows plainly when the bird flies.

The small fry are for the most part the Large-billed and the Yellow-throated Scrub-Wrens, *Sericornis magnirostris* and *S. citreogularis* respectively, together with the Brown Fly-eater, *Gerygone fusca*. The nests of the larger *Sericornis* and of the *Gerygone* are common sights, built of beautiful green moss, and hanging suspended from a Lawyer Cane. But the Scrub-Wren's nest is a very bulky pear-shaped structure, quite 30 inches in length, whereas the *Gerygone*'s home is very neat, and not more than 7 inches long, including its tail-like appendage. The Yellow-throated Scrub-Wren lays two large buff-coloured eggs, but is often ousted from its home by the smaller Large-billed species, which never builds a nest if it can "jump" a ready-made one. A nest was recorded containing the extraordinary number of eight eggs, comprising two sets of three each of the Large-billed and one clutch of the Yellow-throated. The conclusion drawn is that a *S. magnirostris* had turned out the rightful owner, but was itself ejected by another of its own species. I hardly think the last bird had the best of the bargain with eight eggs to hatch. These large nests are often the foster-home for the egg of the Fan-tailed Cuckoo, *Cacomantis flabelliformis*.

The Whip-bird, *Psophodes crepitans*, the Yellow-eared Honey-eater, *Ptilotis lewini*, and the Rufous Fan-tail, *Rhipidura rufifrons*, are three birds very plentiful indeed, and they are three species

also found within a short distance of Melbourne, in the cool retreats of the Dandenong Ranges. The honey-eater is a noisy bird, and often comes into the gardens, where its moss-made nest, containing two white sparsely-spotted eggs, is sometimes found in the lemon trees. The Ground-Thrush is represented here by the Russet-tailed species, *Geocichla heinii*.

The "Big Scrub" is the home of the Rifle-bird, *Ptilorhis paradisea*, which belongs to a subdivision of the Birds of Paradise. There are three species of Rifle-birds in Australia, all frequenting the eastern coastal districts, but this species has the most southern habitat. It is not adorned with plumes of any description, but the dress of the male bird, nevertheless, is very handsome velvety-black, bespangled on the crown of the head and chest with scale-like feathers of a brilliant metallic green, while the young male and the female wear coats of a protective brownish colour. The Rifle-bird hunts for its food about the tree trunks, and may be seen running up the stem, prying into every crevice with its long sickle-shaped beak, or disappearing into the holes in search of insects, much after the manner of a Tree-creeper. Its call is harsh and easily recognized. There can be no mistaking the measured "yass yass" of the male bird, uttered so deliberately, with a pause of a second or two between each syllable. A short single "yass" locates the female, while a young male perhaps may attempt the double call, but it is hurried and unpractised. For many years the nest and eggs of the Rifle-bird remained undiscovered, till at last, only the season previous to my visit, they were brought to light by the energy of Mr. Bailey and a friend. The eggs proved to be as uniquely marked as those of the other two species, and the nest was curiously ornamented with pieces of shed snake-skin.

At the time of my visit to the Scrub the majority of birds had finished nesting, and very few eggs were obtained, but there was reason to believe the season had been very early, for the previous winter, being very mild, had induced the birds to begin nesting sooner than usual; whereas in December and January of the previous season the Rifle-bird's and several Fruit-Pigeons' nests were taken. But about Wollongbar the scrub is being cleared off considerably, and consequently the birds are moving back. One week I spent, at the invitation of Mr. H. R. Elvery, who is an enthusiastic oologist, at his selection near Alstonville, where the birds were more numerous and less disturbed. One bird pointed out to me was the Albert Lyre-bird, *Menura alberti*, which was heard in the mornings whistling away along the creek, imitating other birds' calls to perfection. The male of this Lyre-bird does not possess the two large feathers in the tail as found in the other two species. Among the lilies in the scrub occasionally are seen the leaf-made egg-mounds of the Brush Turkey, Tale-

gallus, from one of which Mr. Elvery took no less than 35 eggs in a season. Several pairs of the two ground birds, *Pitta strepitans* and *Orthonyx spinicaudus*, were also here noted. Many nests have been taken by Mr. Elvery of both kinds, and he has supplied some very interesting notes. The *Pitta* usually builds its nest in the fissures at the butts of Buoyong and Bean trees. The covered-in structure, standing 12 inches high and 8 wide, is neatly made of green moss, dead leaves, and bits of stick, while the exterior is ornamented with a few black skeletons of Staghorn leaves. The entrance at the side is 3 inches in diameter, and often a small platform of sticks and rotting wood leads up to it. The eggs, four in number, are white, covered with small black spots; it is noticed that one egg in a clutch is not so heavily marked as the remaining three. The *Pitta* has a very striking plumage of brilliant colours, for the upper surface is green, with beautiful light-blue on shoulders and tail coverts, and the under surface of brown is set off with a bright splash of vermillion on the abdomen. Its food consists of snails, which it finds upon the ground, and soon frees of the shell by hitting on a piece of stone. The call consists of three whistling notes, the last of which is a tone or two higher than the former two, and accents are on the first and third. It is a call easily imitated, and by so doing the bird can be brought within gunshot. The *Orthonyx* lays two pure white eggs in a nest made of dead leaves and bits of decaying stick, about the same size as the *Pitta*'s, although the bird itself is much smaller. The nest is placed on the ground, against a stone or a log forming suitable protection, and is always in the vicinity of rotting fallen timber.

Along the creek live a pair of Yellow-necked Bitterns, *Butoroides flavicollis*, owning a stick nest 14 inches across, situated on a branch overhanging the water, from which many clutches of three eggs each have been taken.

The last bird to be mentioned is, however, not of least importance. It is the Scrub-bird, *Atrichia rufescens*, quite a unique species, measuring about 6 inches in length, with plumage of a rich brown, each feather being finely barred with transverse lines of black, relieved only by a fawn-coloured throat. A solitary male bird will frequent a mass of fallen timber, or an entanglement of Lawyer vines, and from its hiding place pour forth all descriptions of sounds, for it is an accomplished mimic. But the curious thing about the species is that the female has never been found. Collectors have shot dozens of specimens, but all proved to be male birds. However, one important step has been taken towards determining their economic history, for in October, 1898, a nest and two eggs, identified as belonging to the species, were taken by Mr. S. W. Jackson in the Clarence River district. The *Atrichia* approaches in relation nearest the Bristle-birds. There is

a larger species found in Western Australia, but practically less is known of it than of the Big Scrub bird. Surely Australian ornithologists have an interesting point to settle yet by bringing to scientific light the female *Atrichia*.

DESCRIPTION OF SOME NORTH AUSTRALIAN BIRDS' EGGS.

BY D. LE SOUEF, C.M.Z.S.

(Read before the Field Naturalists' Club of Victoria, 19th Nov., 1900.)

COLLYRIOCINCLA PALLIDIROSTRIS, Sharpe, Pale-headed Shrike-Thrush.

These birds have a beautiful clear note, like the other members of the same family, and are found in the north-eastern portion of Australia, but their exact limit is difficult to define. They frequent scrubby country or small open patches in the scrub, and the site they choose for their nest is generally on a thick bunch of mistle-toe or similar place. The structure is lightly built of stalks of grass and vine tendrils, and lined with fine, dark-coloured tendrils, and measures—internal depth, $2\frac{1}{4}$ inches; external, 4 inches; internal breadth, 3 inches; external, $5\frac{1}{4}$ inches. The eggs are white, with markings of varying shades of burnt sienna scattered over the surface, but mostly over the larger end, especially on the apex; those under the surface are lilac. The markings vary in size on different eggs—some being few and large, and others small and numerous. The shell is slightly glossy, and they measure—(a) 1.12 x .80 inch, (b) 1.6 x .78 inch, (c) 1.10 x .80 inch. The nest and eggs were found near Cooktown, Queensland, on the 19th of November, 1899, three being the full clutch. This bird is lighter in colour than *C. brunnea*, and is easily distinguishable from it.

SERICORNIS FRONTALIS, Vig. and Hors. (*S. minimus*, Gld.),
White-browed Scrub-Wren.

In the British Museum Catalogue this species is made synonymous with *S. frontalis*. As is well known, birds found in Northern Australia are generally smaller than those of the same kind found in the more southern portions of the continent, and this bird is probably a case in point. As will be noticed, its eggs are considerably smaller than those of *S. frontalis* taken in the Clarence River district of New South Wales; then also *S. frontalis* (*S. gularis*, Legge), found in the Kent Group of islands in Bass Straits is a large bird again, and its eggs correspondingly so. The northern variety, like the others, frequents scrubby country, and is generally to be seen on or near the

ground. One of their dome-shaped nests was found on 22nd October, 1899, in the Cooktown district, North Queensland, and was situated among a bunch of dead leaves in a small scrubby bush, about 2 feet from the ground; it was composed of leaves and rootlets, and lined with fine tendrils and a few feathers. The entrance was very small, being $\frac{3}{4}$ of an inch in diameter. The structure itself measured—internal depth, 3 inches; external, $4\frac{1}{2}$ inches; internal breadth, $1\frac{3}{4}$ inches; external, 3 inches. The eggs, three in number, are of a faint reddish brown, with light brown fleecy markings on the larger end, where they form a zone near the apex. There are no markings on the smaller end. They measure—(a) .70 x .51 inch, (b) .68 x .50 inch, (c) .74 x .52 inch.

The measurements of a clutch of *S. frontalis*, taken in the Clarence River district, New South Wales, are as follows:—(a) .75 x .55 inch, (b) .78 x .58 inch, (c) .77 x .59 inch; while a clutch of *S. frontalis* (*S. gularis*, Legge) taken in the Kent Group of islands by Mr. A. J. Campbell, measure—(a) .91 x .67 inch, (b) .90 x .65 inch, (c) .88 x .65 inch.

PACHYCEPHALA PENINSULÆ, Hartert, Cape York Thickhead.

These birds are found in the dense scrub-covered country of N.E. Australia, and are therefore often difficult to catch sight of, as they appear to dart through the thick undergrowth. Their nests are generally built in some thick-foliaged bush, the birds apparently choosing the densest they can find. One of them was found in the Bloomfield River district, North Queensland, on 9th October; it was an open cup-shaped structure, compactly built of grass-stalks and lined with fine tendrils, and measures—internal depth, 2 inches; external, $3\frac{1}{2}$ inches; internal breadth, $2\frac{1}{2}$ inches; external, $3\frac{1}{2}$ inches. The shell is slightly glossy, and white in colour, with a few small markings of dark brown, which at the larger end form a zone. There the markings are also larger; those under the surface are lilac. The eggs measure—(a) .84 x .61 inch, (b) .85 x .60 inch.

TRICHOGLOSSUS NOVÆ-HOLLANDIÆ, sub-sp. SEPTENTRIONALIS, Robinson.

I found the eggs of this bird in the Bloomfield River district on 6th November. The birds themselves were exceedingly plentiful, and their screeching notes generally to be heard, either when the birds were feeding or on the wing. The eggs were laid in a hollow spout at a considerable distance from the ground, and were lying on the decomposed wood at the bottom; they were two in number and slightly nest-stained. The shell is a dull creamy-white, with no gloss, and they measure—(a) 1 x .90 inch, (b), 1.1 x .86 inch.

NOTE ON THE OCCURRENCE OF THE EUROPEAN CRAB, *CARCINUS MÆNAS*, LEACH, IN PORT PHILLIP.

BY SYDNEY W. FULTON AND F. E. GRANT.

(Read before the Field Naturalists' Club of Victoria, 19th Nov., 1900.)

INCLUDED in a series of specimens of Crustaceans collected by us in Port Phillip this spring were a number of forms which we were unable to identify with the description of any recorded Australian species. The local museum collection not being then available for comparison, we forwarded some of these to Mr. G. M. Thomson, of Dunedin, a well-known worker in the Crustacea, who had kindly promised to assist us by checking identification. He writes as follows:—"These specimens are most interesting, and want carefully going into. I think it is the common English shore crab, *Carcinus mænas*, and if so, how comes it to be on your coast, and where does it occur? If it is all over the coast it is probably indigenous; but if so, why has it not been described before? If it is local in distribution it may have been introduced, and if so, how? There is no great difficulty in its being introduced, say in ballast, &c., for it is most abundant in the old country. This wants all most careful working out—first, of course, the identification, and next the distribution."

Through the kindness of Professor Spencer and Mr. J. A. Kershaw we have since had our specimens compared with named examples in the Australian Museum in Sydney. We also forwarded specimens to Mr. A. Zeitz, of the South Australian Museum, who writes us:—"The occurrence of *Carcinus mænas* on the Australian coast is new to me. While reading your letter through I could not make myself familiar with this fact without thinking that it must have been somehow introduced. The two specimens you have sent to me leave not the slightest doubt about the correctness of your identification. If you had told me that they had come from Europe I would have never doubted it. I have compared them with specimens which I have collected myself in the Baltic Sea and North Sea, and I can say that I am very familiar with this Crustacean."

We have also carefully compared them with the detailed description and with the plate given in Bell's "History of the British Stalked-eyed Crustaceans," 1853, with both of which they agree, and there can be no doubt as to the identity of the species.

We have found this crab plentifully distributed along the beaches and rocky points as far as Frankston on the one side and to Portarlington on the other (and learn from the fisherman that it is frequently caught in their nets), its general habitat agreeing closely with that given in Bell's work above referred to.

A paper was published in the journal of the Royal Dublin Society, vol. i., p. 111, 1856, entitled "Remarks on the Habits and

Distribution of Marine Crustacea on the Eastern Shores of Port Phillip, Victoria, Australia, with Descriptions of Undescribed Species and Genera," with two plates, by John R. Kinahan, M.B., T.C.D., M.R.D.S., who spent some weeks here in 1855, and has catalogued sixteen species of crabs as occurring along our coast between Williamstown and Picnic Point, which he appears to have carefully searched. None of the commoner species now occurring are omitted from his list, while some of the rarer ones are included. No mention is, however, made by him of *Carcinus mœnas*, although had it been present in anything like the numbers in which it is now found it could scarcely have been overlooked by so practised an observer. No reference is made to it in Haswell's "Catalogue of the Australian Stalk and Sessile-eyed Crustaceans," 1882, nor in any other work dealing with the Australian Malacostraca of which we are aware.

It consequently seems more than probable that the species is an introduced one, but it would be interesting to know whether any of the members have noted its occurrence at any other points along our coast.

The existence of an introduced marine animal such as this appears to us to be especially noteworthy, as, although the terrestrial fauna of Australia has been so largely modified by introduced European genera, the list of introduced marine forms is a very small one; and it will be of interest to observe whether *Carcinus mœnas* will, in course of time, replace to any extent the common species of *Paragrapsus*, *Cyclograpsus*, and others whose habit of life is similar, and whose place it fills in European littoral fauna.

You will find on the table a number of specimens taken in Port Phillip, and one male specimen kindly sent to us by Mr. A. Zeitz, of Adelaide, collected by him in the Baltic, for comparison.

THE BOTANY OF COOK'S FIRST VOYAGE.

By PROFESSOR MORRIS, Litt. D.

ILLUSTRATIONS OF THE BOTANY OF CAPTAIN COOK'S VOYAGE ROUND THE WORLD IN H.M.S. *Endeavour*. By the Right Hon. Sir Joseph Banks, Bart., K.B., Pres. R.S., and Dr. Daniel Solander, F.R.S., with determinations by John Britten, F.L.S., Senior Assistant, Department of Botany, British Museum. Part I.—Australian Plants. Printed by order of the Trustees of the British Museum.

THE latest book on Australian botany ran a good chance of being the earliest. The history of the handsome work now being published by order of the trustees of the British Museum is one of the most remarkable amongst books. It is a pity that on the title page Banks is described as "Sir Joseph," and with titles of

honour, for it was not the President of the Royal Society that collected the botanical specimens so admirably illustrated in this handsome volume ; but the British Museum, in its rules for cataloguing, lays down the doctrine that the last name or title is always to be used. The works of George Eliot are entered as by Mrs. Cross, and probably the works of Sir John Lubbock have by this time been transferred to Avebury, Lord. The collector of these specimens was a young man of 26, with a passion for botany, but up to any fun, and decidedly what boys call "larky." It is now more than 130 years since the specimens were collected, and about 120 since the plates were engraved.

In April of the year 1770 Botany Bay was first entered by His Majesty's bark *Endeavour*, on board which vessel was a young gentleman of fortune, Mr. Joseph Banks, educated at Eton and at Oxford. He had engaged two artists to illustrate the voyage, but during it both of them died. He had also secured the services of a Swedish botanist, Dr. Solander, the pupil, and said to be the favourite pupil, of the great Linnæus; for Mr. Banks had a passion for botany as well as for travel and adventure. The two young men revelled in the new plants that they found on the shore of the bay, and Cook expressly states that it was owing to "the great quantity of plants Mr. Banks and Dr. Solander found in this place" that he changed the name of the bay from the earlier "Stingray" to its later euphonious name. Though a few other opportunities, three in all, occurred to the naturalists of landing on the eastern coast of Australia, then called New Holland, the time allowed by the captain was usually brief; but a chance that nearly proved fatal gave them and their companions several weeks on shore. One night the bark ran upon the point of a coral reef, and narrowly escaped total wreck; it became necessary to put into some bay for the repair of the ship's hull. The place chosen was the mouth of a river, which, after the ship, was called the Endeavour River, where, more than a century later, a small town sprang up out of the exigencies of a goldfield, and was promptly and properly named Cooktown. Here the botanists collected many more specimens. Here they first saw the kangaroo. Here, and here only, they heard the language of the aborigines.

On the arrival of the *Endeavour* in England great was the interest felt, and many a trace of it can be found in the literature of the day. It was decided that a narrative of so important a voyage must be prepared by some man of letters, and Dr. John Hawkesworth* was selected. The sum given by the publishers (£6,000) for the copyright is a measure of the general expectation of something interesting; three guineas was the price for a single

* The fullest account of Hawkesworth that has ever appeared is in the *Gentleman's Magazine* for September, 1900. It is not without interest to Australians.

copy. It was afterwards said that the publishers lost heavily by the bargain. Cook himself was quickly sent off upon his second voyage, which disproved the existence of "Terra Australis Incognita," a great continent believed to reach from the South Pole far to the north of the Antarctic Circle; but it is said that on his return he was not well pleased with the way in which the first voyage had been described. Mr. Banks is mentioned with gratitude by Hawkesworth as having contributed valuable material for his narrative.* Now Banks strongly desired to accompany Cook on the second voyage, and made lavish preparations; but disputes arose, chiefly with the Comptroller of the Navy Board (Sir Hugh Palliser), about the accommodation on the ships, and neither Banks nor Solander went.

Whatever of natural history found a place in Hawkesworth was of the popular kind. Banks felt that, in addition, a scientific book was needed to give due account of the many treasures new to science that Solander and he had discovered. Banks, therefore, retained Solander as his secretary at the same salary of £400 a year, and caused, at his own cost, copper plates to be engraved of the plants, animals, shells, and the like found on the voyage, and was preparing an elaborate work. But, young as he was, he gained a very prominent place in the learned world of London. Before many years had passed he was elected President of the Royal Society, a position that he held for an extraordinary length of time—more than 41 years. Nor did he allow, as others had done, the office to be a sinecure. Work grew upon his hands, so that it was hard to find leisure for the bringing out of his *magnum opus*. Had Dr. Solander been a vigorous and energetic man he could practically have done the business for Banks, but it is not difficult to read this philosopher's character. Amiable and beloved by all, he was by nature dilatory. From a letter published by Sir Joseph Hooker† it is evident that Linnæus regarded his disciple as prone to put off until the morrow what he felt disinclined to do to-day, and after Solander's death letters were found in his pockets from his mother received some time previously but unopened.

In Hasted's "History of Kent,"‡ Banks is represented as giving forth the following statement:—"Botany has been my favourite science since my childhood, and the reason I have not published the account of my travels is that the first from want of time necessarily brought on by the many preparations for my second voyage was entrusted to Dr. Hawkesworth, and since that I have been engaged in a botanical work, which I hope soon to publish,

* Hawkesworth's book was published in 1773.

† Hooker's edition of the Journal of Sir Joseph Banks (Macmillans, 1896), pp. xl., xli.

‡ *Apud* Hooker, edition of the Journal of Banks, p. 26.

as I have near 700 folio plates prepared.* It is to give an account of all such new plants discovered in my voyage round the world, somewhat above 800."

Two months after this was written, Solander died. It was then eleven years after the return of the *Endeavour*, and the book was still unwritten, though many preparations had been made, and nearly 800 copper-plates were ready. The death of his friend and companion on the voyage took all heart out of Banks for proceeding with the big book. More and more did other matters occupy his time and thoughts. The Right Hon. Sir Joseph Banks, P.C., Baronet, became the chief adviser of His Majesty's Ministers on all subjects connected with science or with exploration in any part of the world. After the colonizing of New South Wales, as to which he had borne a great part, he was consulted about almost every detail as to it.† It was Banks that offered the governorship to Bligh, whom he had come to know well from his two bread-fruit voyages, the idea of which was due to Banks. It was Banks that made the arrangements for the voyage of Flinders in the *Investigator*, that engaged Robert Brown, the eminent botanist, and Ferdinand Bauer and William Westall, the natural history painter and the scenery artist.

In all this press of work, the copper-plates were put away, and after the death of Sir Joseph, they, on his bequest, became, with many another article of value, the property of the British Museum. Now, in this last year of the century, 80 years after the death of Sir Joseph Banks, the first part, containing the "Australian Plants," has been published, the first of eight parts, and very beautiful the engravings are. The descriptions that in manuscript "came with the plates are printed verbatim," and Mr. James Britten, of the Botany department of the British Museum, has "added determinations in accordance with the nomenclature at present adopted."

This is surely a remarkable resurrection, and the attention of Australians who love science should be drawn to it.

[The first part of this work contains 100 plates, each devoted to a single species, which are arranged in the sequence of the natural orders, and extend as far as Myrtaceæ. Most of the plants mentioned were collected at the "Endeavour's River" (Cooktown), North Queensland, only about twenty-five being recorded as from "Botany Bay." Of these several are well-known Victorian plants, such as *Viola hederacea*, *Comesperma ericinum*, *Boronia pinnata*, *Correa speciosa*, *Aotus villosa*, *Lotus australis*, *Glycine tabacina*, *Kennedya monophylla*, *Acacia juniperina*, *A. suaveolens*, *A. longifolia*, and *Drosera binata*. The plates on the

* The literary style of Sir Joseph Banks, in spite of Eton and Oxford, was not very satisfactory.

† Ample evidence of this is to be seen in the "Historical Records of N.S.W."

whole appear to be well executed, considering they were probably drawn from dried specimens; that of *Correa speciosa*, however, hardly conveys the hanging appearance of the flowers as seen in a growing plant, while that of *Viola hederacea* is much enlarged. Mr. Britten, in adding "determinations in accordance with the nomenclature at present adopted," has made two notable changes, thus—*Correa speciosa* is included with *C. rubra* under *Correa reflexa*; and *Kennedya monophylla*, formerly *Hardenbergia monophylla*, becomes *Caulinia bimaculata*. When shall we have finality in scientific names?—ED. *Vict. Nat.*]

DESCRIPTIVE CATALOGUE OF THE NESTS AND EGGS OF BIRDS BREEDING IN AUSTRALIA AND TASMANIA. — The Australian Museum (Sydney) authorities hope to issue the first part of the new edition of this catalogue early in the new year. We have been favoured with a perusal of proofs of the letterpress, process engravings, and text illustrations, all of which are executed in the highest style of art, and will be a credit to the author, Mr. A. J. North, C.M.Z.S., and all concerned. The work will be especially interesting to members of the Field Naturalists' Club from the fact that several members have supplied specimens for illustration or photographs for reproduction. The completed volume, which is quarto size, will contain twenty-five plates, figuring about 600 eggs. These can be had hand coloured by those who can afford the extra expense. Those submitted were most faithfully coloured, and, like numerous other drawings throughout the work, reflect great credit on Mr. Neville Cayley. The work will be more than a mere catalogue of nests and eggs, for the synonymy and description of each species, together with brief notes on the habits and distribution, will be given. The completion of the volume will be looked forward to by ornithologists with great interest.

WHITE-BROWED TREE-CREEPER. — While on a collecting trip to Lake Boga, near Swan Hill, in August last, my brother shot, in the Mallee scrub to the west of the township, a Tree-creeper which appeared to be the recently described bird *Climacteris superciliosa*, North, obtained on the Horn Expedition in Central Australia. The birds were somewhat common, as he succeeded in procuring two males and one female. The skins were submitted to Mr. Robert Hall for identification, who considers them undoubted specimens of the White-browed Tree-creeper, and its extended range, so far south as Victoria, is an interesting record. No rufous eyebrow shows on any of the specimens, while the superciliary white band is very distinct. That over the eye of the female does not extend behind the eye as in the males.—H. CLARENCE SMART.

Field Naturalists' Club of Victoria.

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THIS CLUB was founded in 1880 for the purpose of affording observers and lovers of Natural History regular and frequent opportunities for discussing those special subjects in which they are mutually interested; for the exhibition of Specimens; and for promoting Observations in the Field by means of Excursions to various collecting grounds around the Metropolis.

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Authors of Papers published in the *Victorian Naturalist* are informed that reprints of such articles can be obtained at a nominal cost by giving notice previous to publication to the Hon. Sec., from whom all information can be obtained.

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JANUARY, 1901.

The Victorian Naturalist :

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— OF —

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The Author of each article is responsible for the facts and opinions recorded.

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1901.

Field Naturalists' Club of Victoria.

ROOMS—ROYAL SOCIETY'S HALL, VICTORIA ST., MELBOURNE.

BUSINESS PAPER FOR MONTHLY MEETING.

Monday, 14th January, 1901, at Eight p m.

1. Correspondence and Reports.

2. Election of Members.

	Proposer.	Seconder.
Mr. Geo. F. Greenwood ..	Geo. Coghill ..	J. Shephard
"Gurrell," Glen Eira Rd., Caulfield.		
Mr. D. Mahony ..	H. Cummins ..	Geo. Coghill
Union Room, University		

COUNTRY MEMBER—

Mr. H. B. Williamson ..	H. T. Tisdall ..	Geo. Coghill
State School, Hawkesdale		

3. Nominations for Membership.

Members making nominations will oblige by handing the full name and address to Hon. Secretary.

4. General Business.

5. Reading of Papers and Discussions thereon.

(Authors are requested to hand in a brief resume of their papers to the Secretary.)

1. By Mr. D. M'Alpine, "The First Recorded Fungus Parasite on Epacris."
2. By Mr. R. Hall, "Notes on Robin."
3. By Mr. A. J. North, "Additions to Geographical Distribution of Australian Birds."
4. By Mr. T. S. Hart, "Notes on some Geological Specimens."
5. By Mr. G. A. Kearnland, "Australian Desert Birds."

6. Reading of Natural History Notes.

Members who may note any unusual occurrence, or see anything of interest in Foreign or Colonial papers, are requested to inform the Secretary of the same that he may arrange for their bringing them before the meeting; such notes should, however, be brief.

7. Exhibition of Specimens and Conversazione.

Members exhibiting specimens are requested to furnish the Hon. Secretary with written particulars of their Exhibits for record in Minutes and *Naturalist*.

* EXCURSIONS. *

SATURDAY, 12TH JANUARY.—East Kew, *via* Deepdene. Leader, Mr. O. A. Sayce. Meet at Prince's Bridge Station at 1.55 p.m. Pond Life.

SATURDAY, 26TH JANUARY.—Sassafras Gully *via* Bayswater. Leader, Mr. C. Frost, F.L.S. Meet at Prince's Bridge Station 10.10 a.m. General Collecting.

NOTE.—This excursion may be altered or extended. Members not attending Monday night's meeting should see the secretary for particulars.

THE

Victorian Naturalist.

VOL. XVII.—No. 9. JANUARY 10, 1901.

No. 205.

FIELD NATURALISTS' CLUB OF VICTORIA.

THE ordinary monthly meeting of the Club was held at the Royal Society's Hall on Monday, 10th December, 1900. The president, Mr. J. Shephard, occupied the chair, and about 60 members and visitors were present.

REPORTS.

The hon. librarian reported the receipt of the following donations to the library:—"Proceedings Royal Society of Victoria," vol. xiii., part 1, from the Society; "Proceedings Linnean Society of New South Wales," vol. xxv., part 1, from the Society; "Journal of Mueller Botanic Society" (W.A.), vol. i., parts 2, 3, and 6, from the Society; "Transactions of Royal Geographical Society of Australasia (Victorian Branch)," vol. xviii., part 1, from the Society; "Records of the Geological Survey of New South Wales," vol. vii., part 1, from the Department of Mines, N.S.W.; *Queensland Agricultural Journal*, October and November, 1900, from the Department of Agriculture, Brisbane; *Nature Notes*, August, September, and October, from the Selborne Society, London; *Knowledge*, July, August, and September, from the Editor.

ELECTION OF MEMBERS.

On a ballot being taken, Mr. F. W. Scott, Richmond, and Miss Stead, Prahran, were duly elected members of the Club.

PAPERS READ.

1. By Mr. R. Hall, entitled "On the Synonymy of *Pachycephala rufogularis*, Gould, with *P. gutturalis*, Latham."

The author gave his reasons for considering the former bird to be the young stage of *P. gutturalis*, and exhibited a series of skins in support of his opinion.

Several members took part in the discussion which followed.

2. By Mr. D. Le Souëf, C.M.Z.S., entitled "Notes of a Visit to the Riverina District, New South Wales."

The author gave an account of a visit to Riverina in October last, and described the nesting of different birds met with, such as Avocets, Native Companions, Swans, Ducks, Harriers, &c. A wonderful rookery of the Straw-necked Ibis was described, in which it was estimated there were at least two hundred thousand

birds. The paper was illustrated with some very striking lantern slides, showing the nesting and flight of the various birds.

The president and Messrs. Campbell and Keartland congratulated the author on the success of his efforts with the camera and the interesting details recorded.

3. By Mr. J. G. Luehmann, F.G.S., entitled "Description of a New *Lobelia*, from Western Australia."

The author described and named as *Lobelia toppii* a plant recently received from the Murchison River, W.A., and exhibited specimens of the flowers, which were remarkable for their freshness, though picked some seven weeks previously.

NATURAL HISTORY NOTE.

Mr. C. French, jun., contributed a note calling attention to the great quantities of beetles and other insects recently washed up on the beach between Sandringham and Mordialloc.

EXHIBITS.

By Mr. E. Anderson.—Series of the Emerald Moth, *Euchloris vertumnaria*, from Box Hill.

By Mr. C. French, jun.—Five species of Quail eggs; also rare orchid, *Orthoceras strictum*, from Cheltenham, collected 11/12/00.

By Messrs. Fulton and Grant.—Crustacea, sub-order Macrura, *Axius plectrorhynchus*, Strahl., taken in rotten sandstone off Beaumaris, Port Phillip, at a depth of 10 to 20 feet; not previously recorded from Victoria.

By Mr. C. J. Gabriel.—A live specimen of the rare shell *Conus segravei*, from Western Port.

By Mr. D. Le Souëf.—Sets of eggs of Brown Quail, *Synæcus australis*, from Western Australia, Victoria, Central Queensland, Northern Territory, and Tasmania.

By Mr. J. G. Luehmann.—*Lobelia toppii*, new to science, from Western Australia.

By Mr. A. J. Relph.—Photograph of nest of Magpie, built entirely of wire, weighing 20 oz., from Stawell; also photograph of Southern Stone Plover from life.

After the usual conversazione the meeting terminated.

CONTRIBUTIONS TO THE FLORA OF VICTORIA.

No. X.

By F. M. Reader, F.R.H.S. (Communicated by G. Coghill.)
(Read before the Field Naturalists' Club of Victoria, 10th Sept., 1900.)
STIPA EREMOPHILA, sp. nov., F. M. Reader.

A rather slender grass of 1½ to more than 2½ feet. Culms tufted, smooth, terete or somewhat compressed below the nodes,

occasionally geniculate toward the base. Nodes pubescent, leaves mostly long, slender, rather rigid, involute, almost terete and subulate, mostly shorter than the culms. Upper sheath long, smooth, and frequently broad and loose. Upper margin of lower sheaths usually clothed with shining hairs ending at the orifice of the sheath in a tuft. Ligule ciliate. Panicle at first narrow and dense, at length loose and spreading, with capillary fasciculate branches, less than 6 to more than 12 inches long; the pedicels and branches more or less scabrous. Empty glumes long, unequal, purplish or pale; exterior strongly 3-veined; interior usually 5-veined; keels more or less scabrous. Outer empty glume above 9 lines long, acuminate; inner rather more than 7 lines long, acuminate with a longer point. Flowering glume with the rather long stipes about $3\frac{1}{2}$ lines long, densely covered with usually appressed or the upper at length spreading, shining, yellowish- or reddish-brown hairs. Lobes $\frac{1}{3}$ of an inch long. Awns rather stout at the lower portion, shining, from 3 to above 4 inches long, tortuous below, frequently bent twice above, invested with short hairs at the lower part, scabrous above. Palea as long as the flowering glume (without the lobes), hairy along the greater portion of the centre of exterior side. Stamens 3; anthers $\frac{1}{3}$ of an inch long. Lodicules about half a line long. Grain narrow, about 2 lines long.

Flowers October to December. Sandy desert, Lowan, 1898; F. M. Reader.

Among Australian congeners with the flowering glume hairy, the margins lobed, are the species *S. flavescens*, *S. teretifolia*, *S. muelleri*, but in these the ligules are devoid of ciliæ, so that for this new species it is necessary to provisionally establish a new sub-section—margins of the flowering glumes lobed, ligule ciliated.

Probably additional species fitting in this section will be ere long recorded.

CONTRIBUTIONS TO THE FLORA OF VICTORIA.

No. XI.

By F. M. READER, F.R.H.S. (Communicated by G. Coghill.)

(Read before the Field Naturalists' Club of Victoria, 10th Sept., 1900.)

SOME WELL-DEFINED VARIETIES OF THE SPECIES OF THE GENUS STIPA.

STIPA PUBESCENS, R. Br., var. *SEMIGLABRA*, new variety.

Lower sheaths softly hairy; lamina hirsute with spreading hairs. Lower glume nearly an inch long, upper above $\frac{1}{2}$ inch. Flowering glume scantily beset with hairs; awn stout, the smooth hairs scarcely visible.

December, 1899. Billabong of Wimmera, Lowan ; F. M. Reader.

STIPA PUBESCENS, R. Br., var. *TENUIOR*, new variety.

A shorter and weaker plant. Empty glumes much smaller. Awn pubescent with short hairs.

November, 1898. Desert, Lowan ; F. M. Reader.

STIPA PUBESCENS, R. Br., var. *AURICOMA*, new variety.

From less than a foot to about three feet high. Basal leaves frequently short. Leaves with the sheaths more or less hairy with spreading hairs, or scarcely scabrous. Glumes much smaller. Flowering glume densely covered with shining yellowish- or reddish-brown hairs. Awn shortly pubescent or nearly glabrous.

November, 1897. Desert, Lowan ; F. M. Reader.

STIPA ARISTIGLUMIS, F. v. M., var. *CANA*, new variety.

Lower leaves with the sheath softly pubescent with rather long and spreading hairs, the lamina rather rough to the touch. Teeth of empty glumes approaching *S. pubescens*. Awn slightly pubescent.

October, 1898. Desert, Lowan ; F. M. Reader.

STIPA SCABRA, Lindl., var. *PALLIDA*, new variety.

Culms very short. Sheaths generally loose, the upper one embracing the base of the panicle. Panicle much longer than the culm, contracted and frequently dense. Glumes usually shorter. Awn shorter.

November, 1898. Desert, Lowan ; F. M. Reader.

STIPA SCABRA, Lindl., var. *SUBTRICHA*, new variety.

Upper sheath embracing the base of the panicle. Awn shorter, pubescent or puberulous below.

January, 1899. Sandy regions, Lowan ; F. M. Reader.

In *Stipa eremophila* the lobes of the flowering glume are quite as long as in *S. flavescens* ; in the latter, however, the ligules are without ciliæ, and in some varieties of *S. pubescens* and *S. scabra* the lobes are also of quite the same length as those of *S. elegantissima* and *S. flavescens*, but shorter than in *S. eremophila*. Hence the absence or presence of the lobes cannot always be relied upon in discerning species and varieties of this genus, and thus *S. eremophila* should rather occupy a place near *S. hemipogon* and *S. pubescens* than be placed in a new sub-section with the flowering glume lobed and the ligule ciliated. The ciliated or non-ciliated ligules in the respective species appear to be constant, so that it is advantageous, and in order to obtain a ready line of demarcation, to modify the three sections :—

1. Flowering glume glabrous or slightly hairy (in some forms of *S. pubescens* (3rd section) the flowering glume is fre-

quently almost glabrous), produced into hyaline lobes or entire. Palea of various lengths.

Ligule without ciliae, or rarely ciliated.

Stipa dichelachne (*Dichelachne crinita*), *S. micrantha* (*D. sciurea*), *S. elegantissima*, *S. tuckeri*, *S. verticillata*, *S. streptachne* (*Streptachne stipoides*).

2. Flowering glume silky-hairy, the margins at the end more or less produced into hyaline lobes or entire. Palea nearly or quite as long as the glume.

Ligule without ciliae.

Stipa flavescens, *S. teretifolia*, *S. muelleri*, *S. compressa*, *S. drummondii*, *S. pycnostachya*, *S. acrociliata*, *S. setacea*, *S. macalpinei*.

3. Flowering glume silky-hairy, the margins entire or rarely produced into lobes.

Ligule ciliated.

S. semibarbata, *S. hemipogon*, *S. pubescens*, *S. eremophila*, *S. aristiglumis*, *S. luehmannii*, *S. eriopus*, *S. trichophylla*, *S. scabra* (*Streptachne crinita*).

NOTES ON A VISIT TO TOWER HILL, KOROIT.

BY T. S. HART, M.A.,

Lecturer on Geology, School of Mines, Ballarat.

(Read before the Field Naturalists' Club of Victoria, 10th Sept., 1900.)

TOWER HILL lake and island are situated to the south of the township of Koroit, about midway between Warnambool and Port Fairy, and 176 miles by rail from Melbourne.

The island and lake are well known as the central cone and larger crater basin of one of the most distinct of the numerous extinct volcanoes of Western Victoria. Some time ago (February, 1894) I visited this locality. As I know of no available description, I thought it might be well to present some notes on this hill for comparison with the occurrences noted at another locality to be described.

The surrounding country rises at a gentle slope to the edge of the cliff surrounding the lake. Round the lake clear sections do not usually occur, detritus from the upper parts covering the slopes. The base of the cliff is often seen to consist of a limestone of Lower Tertiary age, containing fossil casts at places. Along the west side it is at one place seen continuously for about three-quarters of a mile, but usually is only seen at intervals, though sufficiently frequently to suggest that it probably forms the base of the greater part of the cliff, though covered by

detritus. It reaches to about 100 feet above the water level at one place. Springs sometimes issue at its surface, and other springs whose relation to it is not seen may be concluded to be similarly situated. The numerous wells in the surrounding country also not improbably strike their water in a similar position. (This underlying rock appears at the surface some little distance to the south-west of the lake, on the main road, about three miles from Koroit, and is here also overlaid by tuffs.) Above this are well stratified tuffs and cinder beds—the finer ones compact, the coarser composed of incoherent scoriaceous lapilli. Blocks of basalt, and less commonly of the underlying rock, are found associated with the coarser beds. All the largest noticed were of basalt. Some of these have not only dented the underlying tuffs but cut right through them. The largest noticed was about ten feet in longest diameter exposed. It had crushed through a bed of lapilli two and a half feet thick, and the finer beds below were contorted and sharply fractured, the coarser beds between them being interrupted by the finer ones coming together. The bed to which the block belongs fills in above it, and even thickens over it, so as to be higher at that point. It is very coarse, and contains numerous large pieces of basalt. This is in a road cutting at the south-east of the lake. A quarry on the inside slope, near the same point, also shows many large blocks, most of which, and those in the road cutting, belong to one bed, though they have penetrated to varying distances below it.

Small quarries are numerous in the upper parts of the bank, and afforded facilities for noting the dip of the beds. The outward dips are from 6 to 10 degrees. At two of the quarries some of the beds dip inward toward the lake across the edges of underlying beds. Some of them are curved over, changing from an outward to an inward dip. These inward dips are at the inner sides of the quarries.

At the pumping station, on the north side of the lake, is an outcrop of basalt, apparently a dyke. The surrounding rock could not be seen, but is probably the Tertiary rock in the lower part at least. This is the only basalt visible besides ejected blocks. Vesicular basalt occurs on the sea-coast to the south.

The lake covers an area of about 850 acres, and is almost circular, with a diameter of nearly a mile and a half, but sweeping out by a gradual curve about a quarter of a mile further at the south-west. It is shallow, except a circular clear water area of about 50 chains diameter at the south-west. This clear water extends from the island to the outer bank. No definite information as to its depth was obtainable. A portion of the outer bank, for about 30 chains along this clear water area, is low, showing black soil, with recent shells (*Haliotis* and *Turbo*). Immediately

north of this the most continuous outcrop of the limestone occurs.

The island is near the middle of the lake, a little further from the south-west side, allowing room for the abovementioned clear water area. The length of the island, north to south, is about a mile, greatest width about three-quarters of a mile. It consists, except a small patch near the causeway, of pyroclastic (*i.e.*, volcanic fragmentary) materials, ash, scoriæ, and ejected blocks of basalt, or, more rarely, blocks of other material. A small outcrop of the Tertiary rock occurs, which may be, however, detached from the main mass of that rock. The height of the highest point of the island, near the south end, was approximately estimated at 270 feet above the lake level.

Two very distinct craters occur, one near each end of the island (C on map). The inner slopes are very steep, and where the rock is seen it is scoriaceous, often more coarsely vesicular in the interior, the vesicles being finer near the outside. Each of these craters has a pool at the bottom, near, or probably at, the lake level. The lowest part of the rim of the southern crater is about 150 feet above the pool.

Near the middle of the island, and nearly at the centre of the lake area, if the widening to the south-west be neglected, is a hollow at a high level, its floor being about 200 feet above the lake (V on map). On three sides a ridge surrounds it, but on the south it falls away steeply to a valley. It may represent an early crater on the island. To the south of this valley are several small crateriform hollows, which may also have been centres of activity (X on map). An arm of the lake cuts off a portion of the north-east corner of the island, and another penetrates some distance into the west side.

The lake is, perhaps, better described as an explosion lake than a crater lake. It occupies, not a crater in a volcanic hill, but the hole in the underlying rocks formed by explosive action. Subsidence may have contributed to the formation of the basin. The level of the water in the two recent craters illustrates the small likelihood of water standing in an ordinary crater. The permeability of the material would both maintain it at this level and prevent its remaining higher. The later eruptions have built up the island and almost filled in the lake. They have also added to the rim, as is seen by the beds curving over into the lake basin. These beds must be subsequent to the formation of the basin. The clear water area may represent a site of activity of a late date. The shoaling of the lake generally has been further assisted by the waste of the cliffs and island. The whole illustrates very well that a volcano is essentially a passage of communication to the interior and that the hill is only a consequence of its activity.

From the low dips and the distinct stratification it is probable that the materials were deposited in water. Mr. Selwyn suggests low islands in the sea. It may be noticed, however, that stratification of the tuffs does not necessarily imply deposition in water, and that low dips may in some cases be due simply to the fact that the accumulations had not yet sufficiently raised the level near the vent to give a high dip. If, indeed, we regarded what is now seen as derived from the lake as a vent, such would be highly probable, for the small thickness of tuff, with observed dips, would run out a width small compared with the size of the crater. Deposition on an inclined surface may account for an anomalous dip of the tuff as at Murray Brook, south-west of the lake. It seems, however, much more probable that a vent of this size is the shattered base of a hill of once much greater elevation and more normal proportions.

On my return from Tower Hill I spent one day at Allansford. Lake Wangoom, 3 miles from Allansford, on the west side of the Hopkins River, seems also probably an explosion crater lake.

NOTES TO MAP OF TOWER HILL.

The horizontal shading shows the position of outcrops of the underlying Lower Tertiary Rock.

Q.—Positions of Quarries.

S.—Springs.

A.—Road cutting where the largest basalt block was seen.

The edge of the deep water area is marked by a dotted line.

On the Island—

C.—Most perfect Craters, with pools at the bottom.

V.—Old Crater at high level.

X.—Probable other Craters.

The positions of these craters and their dimensions, also the heights, are only approximate.

The section illustrates the relation of the ash and tuff, and the central accumulations forming the island, to the Lower Tertiary Rocks.

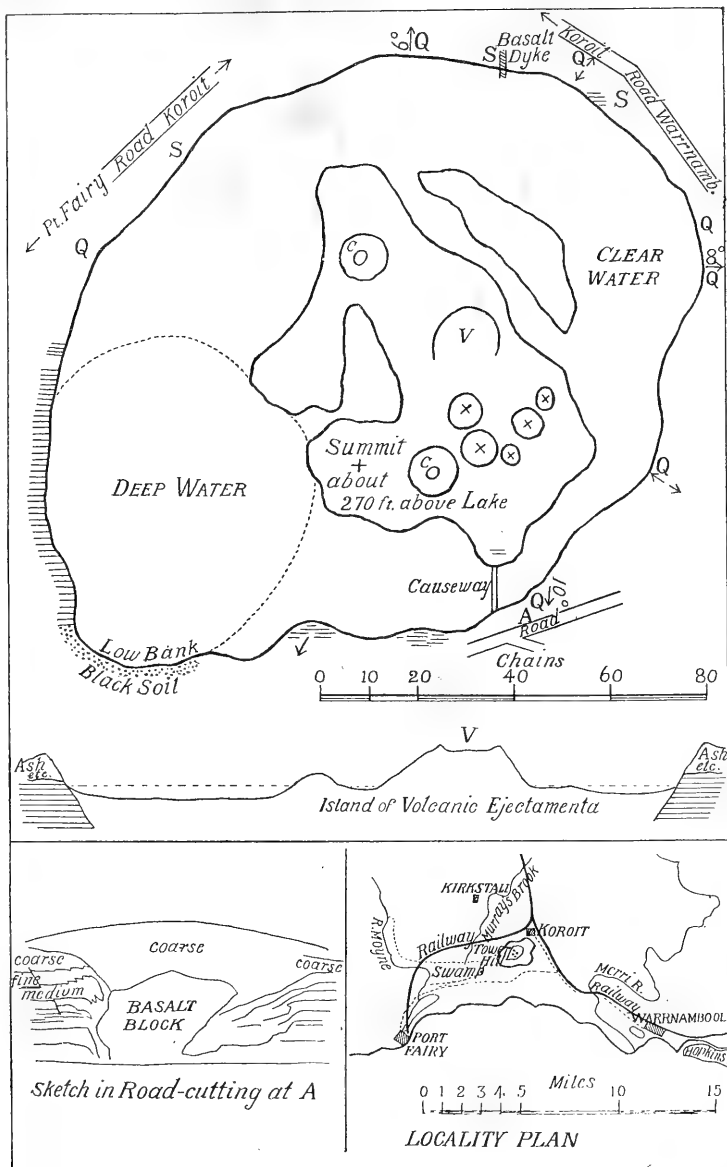
THE TUFFS OF LAKE BURRUMBEET.

By T. S. HART, M.A.,

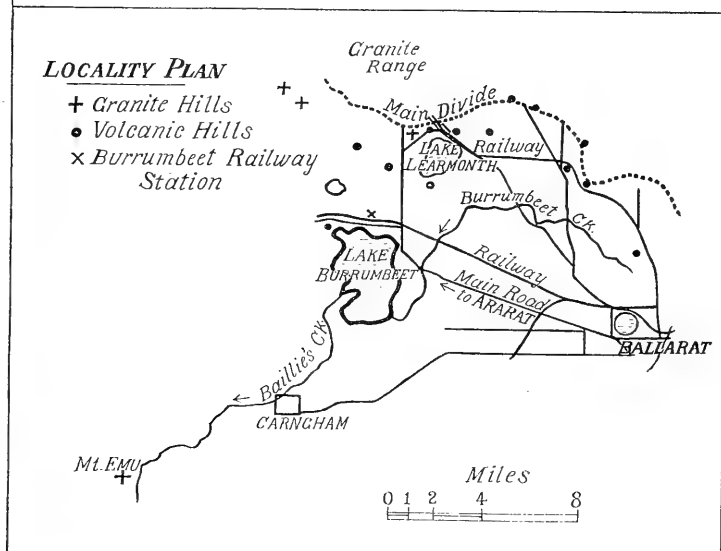
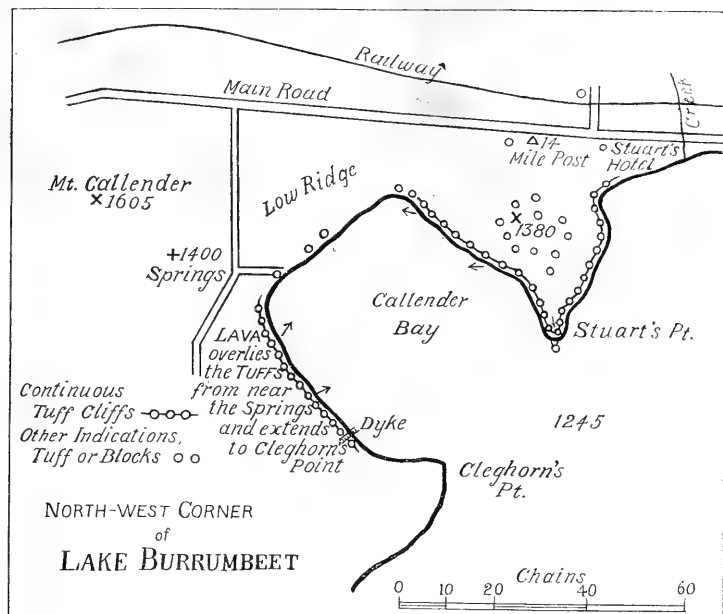
Lecturer on Geology, School of Mines, Ballarat.

(*Read before the Field Naturalists' Club of Victoria, 10th September, 1900.*)

LAKE Burrumbeet is situated about 14 miles west of Ballarat. It extends four miles in a north and south direction and about three miles in greatest width, and has an area of about 5,200 acres. It is said not to be deep. The water supply is chiefly from the Burrumbeet or Bo-peep Creek, which rises north of Ballarat, and enters the lake near the south-east corner. The overflow of any surplus water is nearly opposite to this, to Baillie's Creek and thence to the Mt. Emu Creek, the chief eastern



TOWER HILL.



LAKE BURRUMBEET.

tributary of the Hopkins River. Other small creeks enter at various points. The lake level is about 1,245 feet above sea level.

The railway station is situated about half-way along the north side. The main road from Ballarat to Ararat also skirts the north side. At the north-west part of the lake good sections of volcanic tuff are exposed. The first evidences are at the old Picnic Hotel, where some of the buildings are built of it. The culvert over a small creek is also built mainly of the same material.

DESCRIPTION OF THE SECTIONS.—No tuff was noticed to occur east of a small creek at about $13\frac{1}{2}$ miles from Ballarat, near Stuart's Hotel. At the back of the hotel a cliff begins which continues nearly half a mile, to Stuart's Point. We may speak of this as Stuart's Cliff. This cliff is composed entirely of pyroclastic materials—tuffs, with fragments and blocks of all sizes both of basalt and of the granitic rocks which form the foundation on which they rest. The tuffs vary in the size of the rock fragments they contain, but all the beds are firmly coherent, and the fragments, embedded in a finer paste, are mostly compact, not scoriaceous, basalt. Blocks of very vesicular rock, much decomposed, also occur, containing much aragonite, both in radiating crystals and masses and in globules. Calcite also occurs similarly. Both calcite and aragonite also occur in the tuff itself. White veins of calcite with a combed structure occur between the tuff beds at places, and veins of gypsum at one place. Nodules of very impure limestone with dendritic markings are common, and in some cases appear to have been formed in the tuff.

The blocks of granite and similar rocks especially attract attention, though in reality not so abundant as the basalt blocks. They vary from minute fragments, recognizable as granite or granitic minerals, to blocks of several tons weight; the largest measures about 8 x 5 x 4 feet, and contains at a moderate estimate 10 tons. The prevailing variety is a coarse porphyritic granite. Large feldspars are so abundant that the rock at times appears to consist of feldspar with interspaces filled with granite rather than of feldspars scattered in a granite matrix. A feature of the porphyritic feldspars is the excellent examples of the characteristic simple twinning of orthoclase. Mica is frequently included in these large feldspars. The feldspar varies in colour from flesh-red to pale yellowish shades and white, and the general colour of the granite varies accordingly. The finer matrix in which they are embedded is rich in quartz. Occasionally distinct stout prismatic crystals of biotite are found.

Non-porphyritic granites also occur, often of finer texture, passing by diminution of mica into aplite. Some of the aplites are distinctly pegmatitic in structure. (A variety with very

abundant biotite occurs. Some of the granites contain two micas or muscovite alone, but pale mica is not common, the mica being usually biotite.)

Fine-grained patches in the granite are rare. An examination of the larger blocks of granite reveals to some extent the relation of the varieties to one another when *in situ* in the granite foundation through which the vent was bored. The porphyritic granite is traversed by non-porphyritic veins of slightly finer texture, which, however, are not separated by a definite line but welded into the general mass. Within the vein an imperfectly banded arrangement of the mica parallel to the junction is seen. At times and towards the middle of the vein the mica is often noticeably less in quantity: the vein may pass into an aplite. With these veins is seen another feature. In one of them a line of coarser quartz and felspar occurs, cavities on which allow of definite crystallization. Fragments are found also of fine-grained granite, with crystalline nests of quartz and felspar, but I got no such distinct crystals as may be obtained in a similar granite at Learmonth or Addington, some distance to the north.

Along the side of one of the finer veins is a very coarse band for some distance. It consists of quartz in large patches, felspar with crystal faces developed, and occasional plates of black mica, which sometimes penetrate the felspar. Small cavities allowed free faces on the felspar. The cleavages in twin crystals indicated Manebach twins, and the structure is that figured by Rosenbusch for an intergrowth of microcline and albite. It is a felspar containing potash, but too easily fusible for normal orthoclase.

It seems probable that the aplites and part at least of the non-porphyritic granites occurred as veins in the porphyritic granite. The fragments of these rocks are not usually of large size. The granites containing muscovite were not noticed in connection with the other granites in the same block. The highly micaceous black granite was found as a patch in another granitic rock.

Fragments of decomposed granite also occur, some of which has been completely kaolinized and again indurated, just as occurs where a lava stream flows over decomposed granite. The basalt blocks are either a compact dark variety or one of texture more resembling the common bluestone, sometimes containing minute scales with high lustre, probably hematite or ilmenite.

There was also noticed, but rarely, a rock, perhaps a somewhat decomposed dolerite. It, however, gelatinized abundantly with strong acid. No olivine was visible—if originally present it would certainly have been already decomposed, and may be represented by limonite, which is present. So that it seems most likely the gelatinization was due to a zeolite. The specimen is still under examination.

A nodule of quartzite, quartz grains in a ferruginous and silicious matrix, appeared as if fused. Experiment showed that the iron was in sufficient quantity for the matrix to fuse slightly and become magnetic before the blowpipe.

The tuffs are distinctly stratified, but with many irregularities. The thickness of any individual bed varies very much, apart from the effect of a large block in it. False bedding is prevalent. At one place a hollow of some size has been made in the lower beds prior to the deposition of the upper ones, and these thicken into the hollow, crossing the edges of the lower ones at the sides. A fracture apparently prior to the formation of the upper beds was noticed at one place. Where a block has fallen the beds below are more or less dented or broken. Under small blocks there is usually only a slight bending, but the larger ones often penetrate the beds below, curving and fracturing them. Several of the largest blocks are found to belong to one time, being contemporaneous with a bed containing a number of blocks of basalt and granite, but they themselves now occupy a position below it. A block of basalt of 4 feet horizontally and about 3 feet deep has its upper edge about 3 feet below the bed, and is seen to have cut through the beds, the broken ends being about 10 feet apart at the edge of the hole it formed. A block of granite about 2 feet thick and nearly 6 feet high stands with its upper edge in the same bed. Its sides are flat, representing two parallel joint planes of the granite. The block before mentioned as the largest seen in the cliffs occupies a similar position. It is soon seen that size is not the only factor which influences the depth of penetration. Evidently velocity, which depends on the height from which it has fallen—that is, on the force of ejection—must affect it, and also the shape of the block, and especially of the part which first strikes the bed. The cavities formed where a block has fallen are filled in with smaller materials ejected at the same time. A very large basalt block lies on the beach near the same place. It measured 8 feet 6 inches by 5 feet transversely, and if some neighbouring pieces were part of it, would exceed in bulk the granite block referred to before.

On the weathered surface the blocks and fragments stand out but are firmly attached to the finer materials. There are no loose cinder beds like those of Tower Hill. All along the cliff slipping has taken place, cracks being formed parallel to the cliff, by which large masses have been allowed to move.

Sometimes there is a detached pillar of tuff. At other places caves have been formed, probably largely by the influence of water running in cracks. The roof of such caves sometimes collapses, covering the beach with blocks of tuff. Basalt and granite blocks occur all along the beach, weathered out from the

cliffs or released by its disintegration by the lake water. The lake at its highest is said to wash the foot of this cliff. The fact that it stands with a vertical face up to 30 feet in height is also evidence of this.

The general dip of the beds is low, but not definitely ascertainable. It will be influenced in the first instance by original inequalities, rapid variation of thickness of beds, contemporaneous erosion, the effects of contemporaneous movement and of blows. These produce serious variations in a very low dip. Added to this is the effect of slip. However, by tracing beds along the cliff it was found that their outcrop on the cliff is sensibly horizontal on the whole, though very variable from point to point. The caves appear to show dips inward, but this does not appear to be universal, and evidently caves would be more likely to occur where such was the case. It is also clear that the effect of the slip would be to influence this apparent dip at right angles to the cliff much more than the average height of a bed in the cliff face. Near Stuart's Point the cliff becomes lower, and the tuff beds, as shown in the cliff, dip towards the point. On turning the point they are seen to have a slight inclination towards the point on this side also.

Turning the corner into Callender Bay, the cliff section is not nearly so clear; blocks of basalt and granite still abound on the beach, but none of a size equal to the largest on Stuart's Cliff. A hill rises steeply above the cliff on this part of the bay, and some, at least, of these blocks to my own knowledge have been rolled from above. The inclination of the beds of tuff is for the most part westerly, but though the dip is much more pronounced, it is still rendered somewhat indecisive by the imperfections of stratification, and by slips, and the section is not continuous.

On the promontory between these two cliffs there rises a hill to about 135 feet above the lake. It rises, as mentioned, steeply from the bay side, but a comparatively gentle slope leads from the hill to Stuart's Cliff. On it, up to the top, are seen blocks of granite and basalt, some of considerable size, and at places tuff is exposed. Blocks occur as far north as the main road, and tuff was noticed even on the north side of the railway at a water-hole.

Round the head of the bay the steep bank recedes to some distance from the water's edge, and is mostly grassed. A few blocks are seen lying well back from the beach, some of which are granite. The beach itself is sandy. At a small lane tuff can be seen overlaid by basalt *in situ*, and along the south-west side of the bay the tuffs appear again in a good section, but not so steep or so continuously exposed as at Stuart's Cliff. All along this cliff the tuffs are overlaid by a lava stream, first noticed at the lane before mentioned. The cliff gradually becomes lower, and

the thickness of tuff exposed less. From about 30 feet of tuffs at the inside end of the cliff, they lessen till they disappear rather more than half-way along the bay. From there on the low bank is basalt, which forms the rocky point known as Cleghorn's Point. From this point on along the coast no more tuff was seen.

Along this section the same general features are observed, but the dips are more pronounced than at Stuart's Cliff. They range up to 25° , and, though very variable, seem usually to be northerly or north-easterly into the bay. The included blocks are similar; the largest is of basalt, of about 5 feet diameter as exposed. Granite of similar types occurs, but in smaller blocks. Again, a number of large blocks—not all—belong to one bed. Under the lava stream the usual dull brownish colour of the tuff is altered to bright red.

About half-way along the bay the tuffs are traversed vertically by a wall of compact basalt in which a large block of tuff is included. This basalt is continuous, so far as can be ascertained, with the lava stream above. At one place it is somewhat vesicular and slaggy. There are no indications which would point to infilling of a cleft from above. It may therefore be regarded as a dyke, though it cannot be traced to continue across the beach. It forms a slight projection in the line of the cliff. The neighbouring beds are somewhat bent in different directions.

The lava stream is traceable, with a uniform slope, to near the foot of the steep slope of Mt. Callender. This hill is a scoria cone. The surface in the upper parts is thickly strewn with scoriaceous basalt. It rises to about 360 feet above the lake, about 200 feet of which is on a steep slope. No natural sections occur, and the only excavation worth notice is a small hole made on the east side, which shows irregularly aggregated scoriæ. A slight hollow exists on the north-west side, due, probably, to weathering. At its base on the south is a more marked depression of small size, due, perhaps, to slips. On the south-east of the mount, above where the lava is first noticed, abundant water issues, indicating a more impervious material below—that is, the lava. Above this small slips appear to have occurred, the scoriæ slipping on the rock surface below. Northward neither the road nor railway has any cutting. Lava outcrops near a lagoon north of the mount, and from there eastward a concretionary ironstone is the chief material exposed in the shallow drains. It may possibly be due to decomposition of volcanic ash.

A low ridge connects Mt. Callender with the lower hill before mentioned. Callender Bay thus receives no stream of water, but only the water from the surrounding slopes. It is said to be shallow, with a muddy bottom.

An attempt to estimate the position of the vent or vents may

be based on three points—general disposition of material, dip of beds, and distribution of large blocks. None of these give very satisfactory conclusions. The source of the lava is from under Mt. Callender. No dyke appears in the cliffs near here, but it may come most likely by direct overflow. Its surface, too, is inclined away from Mt. Callender. The scoria cone may be simply a cone built over a vent here. A subsidence in the area occupied by the bay would be the easiest explanation of the dips of the tuffs as a whole, though the dips to the north of the bay would be well satisfied by a centre between the little hill and Stuart's Cliff, and near to the largest blocks. Perhaps a number of vents were in existence. The simplest explanation, as a whole, is a centre in Callender Bay around which the tuffs were formed, and at which there has been later subsidence, followed by a new centre on the west of its rim on which has been formed the scoria cone of Mt. Callender.

The area and thickness of the tuffs must have been to some extent, perhaps considerable, lessened by denudation. Where tuff or scoria rested on lava they might easily be removed completely without the surface of the lava being much affected, for the formation of springs on the surface of the less pervious rock would tend to cause slips, if the slopes allowed it, and the difference in resistance to the denuding agencies would favour complete removal, with little sign left either of the material removed or of extensive denudation. Except for the springs and slight slipping at Mt. Callender nothing of this was noticed. There is no likelihood that in the bay the tuffs have been exposed to much action of moving water in currents, for no stream enters it; nor are the cliffs directly exposed to much wave action—Stuart's Cliff is much more exposed. The disposition of the streams feeding the lake may have been such at some time as to cause easy removal of tuff at this place by a current of water. I have met with no direct evidence of this.

The tuffs were probably deposited in shallow water, which seems the readiest way to account for the original low dips of part at least, and possibly a great part, and for the false bedding and other irregularities. Scouring out of beds just formed could take place as easily in shallow water as on land, and the other features seem more easily explicable on this hypothesis. Lacustrine conditions might be produced in a variety of ways, the simplest being blocking of streams by products of other vents. Unequal movements might have occurred also at the time of the volcanic activity of so many vents, and may have caused formation of a lake.

There appears no likelihood that any of the basalt along the north of the lake should be referred to these centres of eruption.

The surface features favour an origin to the north, where several vents occur.

Nowhere along these sections does the underlying granite appear *in situ*. It comes to the surface to the north in many hills, and is indicated by blocks ejected from other points of eruption. To the south it again rises as a prominent hill through the plains at Mt. Emu, near Skipton. It may be noticed that many granite areas represented to the south on Mr. Selwyn's map of 1863 are omitted on the map at present in use. The Mt. Bolton Range to the north comes within the area of the Learmonth sheet mapped by Mr. Norman Taylor, and here porphyritic and other granites are noted.

The great variety of granite would naturally be much more noticeable in the tuffs, where there is an absence of any selection. On the granite hills the weathering caused more resistant ones to stand out, by the decomposition of the others. Easily decomposed varieties will therefore not appear in their true proportions on a weathered range.

For the photographs exhibited to-night I have to thank Mr. O. E. Jager, a student of the Ballarat School of Mines, who took some of them at a geological class excursion; and Mr. A. E. Campbell, Lecturer in Photography, and his assistant, Mr. Verey, for others which were kindly taken by the latter under my direction for the purpose of illustrating this paper.

NOTES ON THE PLAIN WANDERER.

BY G. A. KEARTLAND.

(Read before the Field Naturalists' Club of Victoria, 19th Nov., 1900.)

THE Collared Plain Wanderer, *Pedionomus torquatus*, Gould, occupies a rather unique position in the avifauna of the colony. Although classed with the Quails, their anatomy is that of the Bustard, and their flesh is dark coloured. An adult female weighs about $3\frac{1}{2}$ ozs., whilst the male seldom exceeds $2\frac{3}{4}$ oz. Unlike most birds the female is not only considerably larger than her mate, but is more handsome in plumage, being ornamented with a broad black and white collar and a bright chestnut patch on her chest, whilst her diminutive consort is destitute of both, and is frequently mistaken for a young bird. The name is derived from the fact that the Wanderers invariably resort to lightly-grassed, open, plain land, such as we find at Essendon, Werribee, Bulla, and Melton, at all of which places my brother-in-law (Mr. W. P. Henderson) has either shot or caught them.

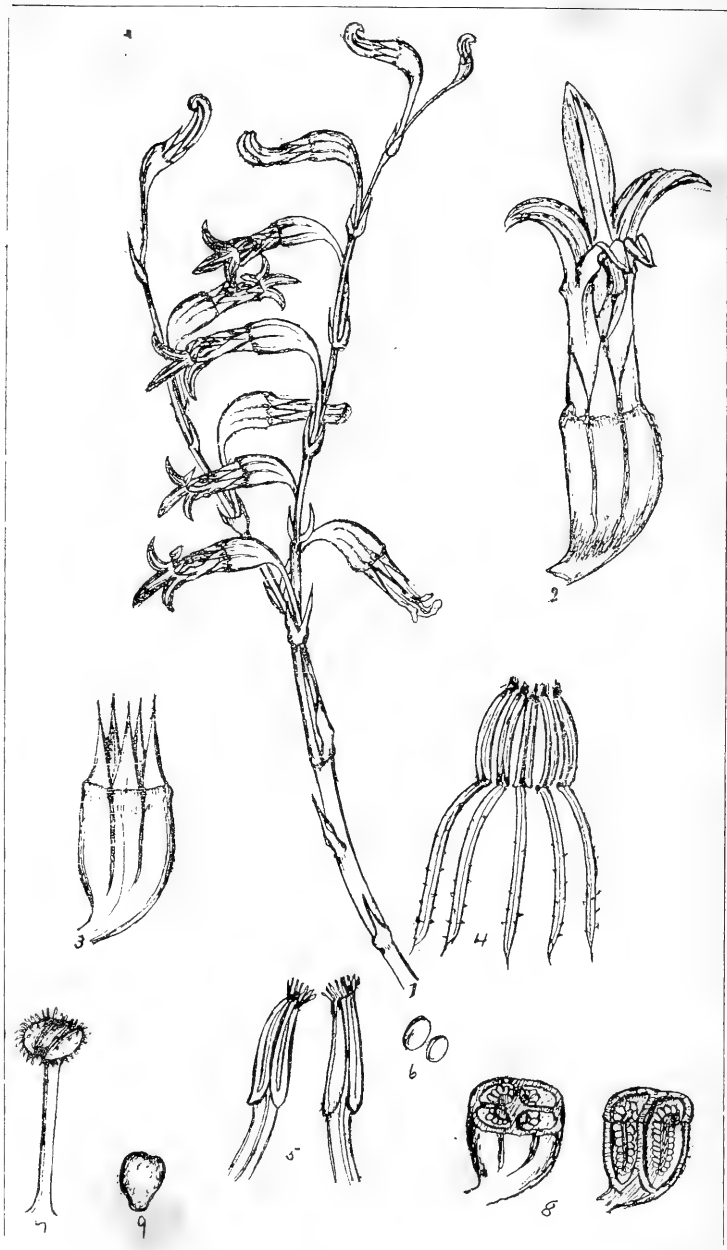
Furnished with a pair of rather long legs, bare for some

distance above the joint, the Wanderer can run very fast for a long distance, and only takes flight when suddenly startled or hard pressed. They will often crouch before a dog and permit themselves to be caught instead of retaining liberty by the aid of their wings. They are solitary in their habits, seldom more than one or two birds being found in a field. Whilst quail-shooting with Mr. Henderson at Melton on 9th April, 1892, our dog (which was a remarkably good worker) made a decided "set," but before either of us got within shot he started off for about twenty yards, and again "set." This was repeated again and again until we had traversed the greater part of a 50-acre paddock in a zig-zag fashion. At last we saw a Wanderer running like a rat through the grass. During the time occupied in following the dog we must have walked nearly half a mile. The same tactics were followed for about an hour, during which three more birds were shot. On several other occasions I have known them to "lie close" when "set" by the dog, and continue in that position until caught.

The pair of live birds which I exhibited at the August meeting of this Club were obtained in this manner. The male was caught at Campbellfield on 22nd May, and the female at Essendon on 2nd July. They soon became very tame, and took insects readily from my hand. Although the female was the last caught, she soon settled down to her altered circumstances, and assumed control of the domestic arrangements. Whether she presumed on her size is uncertain, but her partner had to take a back seat when any dainty morsel was thrown to them. They thrive well on canary seed, but are equally fond of worms, flies, or green food, such as chickweed, thistles, or cress. Gould mentions that those in the possession of Sir George Grey were fed on pounded wheat, raw or boiled rice, and flies.

Their times of nidification appear to be as varied as their *menu*. Early in March of this year Mr. Dixon caught an adult male and a half-grown young one. In June Mr. Coles took an egg from a bird he was skinning, but a clutch of eggs in the possession of a friend were taken in November. On 15th August my birds showed indications of breeding. The female simply scratched a slight hollow in the litter on the floor of the aviary, in which she deposited four eggs, somewhat resembling those of a plover. Unfortunately, these were destroyed, and in about three weeks she laid again, with the same result; but this time the destroyer was proved to be a Cockatoo Parrot, which was removed. When about to lay the female squatted on the ground, elevated her feathers, and, keeping her chest down, turned round many times, during which she sustained a low, "cooing" noise, and on the male approaching her at this time he was immediately chased away.





LOBELIA TOPPII, n. sp.

DESCRIPTION OF A NEW LOBELIA FROM WESTERN AUSTRALIA.

By J. G. LUEHMANN, F.L.S., Government Botanist.

(Read before the Field Naturalists' Club of Victoria, 10th Dec., 1900.)

LOBELIA TOPPII, sp. nov., Luehmann.

A herb from 6 inches to a foot high, leafless as far as known, the leaves being replaced by scales, glabrous, creamy-white, except the flowers, of waxy consistence. Scales lanceolate, 2 or 3 lines long. Flowers in simple racemes or divided into two or three branches, mostly turned to one side, 6 to 10 in a raceme. Bracteoles 1 to 1½ lines long, deltoid. Sepals lanceolate-deltoid, about 2 lines long, shorter than the calyx tube, white. Corolla over half an inch long, the two upper lobes recurved, hardly exceeding 1 line, the three lower lobes of a very pale to an azure blue colour, with a white central line, hardly acute, the central lobe about 3 lines long, the lateral lobes shorter, falcate. Anthers all tipped with a tuft of hairs, their edges of a purple colour. Stigma with a few hairs. Capsule obovoid, nearly half an inch long. Seeds very numerous, not winged.

Near Nannine, Murchison River, Western Australia; A. W. Morgan.

This species belongs to the section Holopogon, and is nearest to *L. gibbosa*; it is named in honour of Mr. C. A. Topp, M.A., F.L.S., Under Secretary for Victoria, and a former president of the Field Naturalists' Club.

The plant is most remarkable for the retention of its vitality; the youngest specimen was despatched from Nannine seven weeks ago, and still looks quite fresh; in fact the flowers did not open till some time after arrival in Melbourne, though it was not placed in water.

EXPLANATION OF PLATE.

- | | |
|-------------------------------------|--|
| 1. *Plant (nat. size). | 6. Pollen grains. |
| 2. Flower. | 7. Style and stigma. |
| 3. Fruit-bearing calyx. | 8. Transverse and longitudinal section of a fruit. |
| 4. Stamens. | 9. Seed. |
| 5. Front and back view of a stamen. | |

2 to 9 enlarged, but to various extent.

THE increasing interest taken in the study of Astronomy has induced the proprietors of *Knowledge* to issue an annual for students and workers in that science specially devoted to their requirements. It is entitled "*Knowledge* Diary and Scientific Handbook, 1901," and will contain, amongst other things, useful tables, original articles, calendar of scientific events, and a blank diary portion

DESCRIPTION OF A NEW SPECIES OF CROW.

By ALFRED J. NORTH, C.M.Z.S.,
Ornithologist, Australian Museum, Sydney.

CORVUS BENNETTI, sp. nov.

Adult male.—General colour above and below, black glossed with purple; primaries and tail feathers black, slightly washed with bronzy-green; bases of the feathers on the upper parts snow-white; bill and legs black; iris white. Total length, 16 inches; wing, 12.3 inches; tail, 7.3 inches; bill, 1.85 inch; tarsus, 2.2 inches.

Adult female.—Similar in plumage to the male.

Habitat.—Moolah, Western New South Wales.

This species, with which I have associated the name of its collector, the late Mr. Kenric Harold Bennett, is also found in some parts of Victoria and South Australia. It may be distinguished principally by its much smaller and straighter bill, its average smaller measurements, and by having the iris pure white in the adults of both sexes. I purpose to distinguish it by the vernacular name of the Small-billed Crow.

The eggs of this species vary from three to five in number for a sitting, are oval or elongate-oval in form, the shell being close-grained and its surface lustrous. The ground colour is of a very pale greenish-grey, which is almost uniformly marked all over with numerous very fine scratches of light umber, and in some specimens are intermingled on the larger end with dots, spots, and small blotches of olive-brown. Length—(A), 1.65 x 1.02 inch; (B), 1.75 x 1 inch; (C), 1.67 x 1.03 inch.

A full account of habits, nidification, &c., will be shortly published in Part i. of "Nests and Eggs of Australian Birds," now in the press.

For the purpose of comparison Vigors and Horsfield's measurements are here given from their original description of *Corvus coronoides* in the Transactions of the Linnean Society of London. Total length, 22 inches; wing, 14 inches; tail, 9 inches; bill, 2.3 inches; tarsus, 2.3 inches.

The bills of three average specimens of *C. coronoides* and *C. bennetti* measure as follows:—

C. coronoides.

Length of Bill.	Height at Nostril.	Width at Nostril.	Locality.
2.2 in. ...	0.8 in. ...	0.7 in. ...	Clarence River, N.S.W.
2.2 in. ...	0.8 in. ...	0.7 in. ...	Wide Bay, Queensland.
2.27 in. ...	0.82 in. ...	0.7 in. ...	Port Darwin, Northern Territory of South Australia

C. bennetti.

1.9 in. ...	0.67 in. ...	0.65 in. ...	Moolah, Western N.S.W.
1.85 in. ...	0.66 in. ...	0.66 in. ...	„ „
1.85 in. ...	0.65 in. ...	0.65 in. ...	„ „

AN ORNITHOLOGISTS' REUNION.

FOLLOWING the custom of former years, about twenty of the leading Victorian ornithologists and oologists dined at Miss Kisson's *Café*, Collins-street, on Wednesday evening, 7th November, 1900, when Mr. D. Le Souëf, C.M.Z.S., M.B.O.U., Assistant Director of the Melbourne Zoological Gardens, was the guest of the evening. Dr. Chas. Ryan, Consul for Turkey, occupied the chair, and after the good things provided had been disposed of, the Rev. W. Fielder, in a happy speech, proposed the health of Mr. Le Souëf, and wished him every success, both in private life and in his natural history pursuits, which was cordially endorsed by the company. Mr. A. J. Campbell, who had acted as secretary for the gathering, read a number of apologies from residents of other colonies, wishing the reunion every success. The chairman then handed to Mr. Le Souëf a memento of the evening in the shape of an illustrated booklet containing the autographs of those present. Mr. A. J. Campbell mentioned that it had been considered by a number of bird-lovers that the time was ripe for founding an Australian Ornithologists' Union, and proceeded to give some particulars of the history of the American Ornithologists' Union, whose organ, the *Auk*, is a well-known authority on bird lore, and he hoped that an Australian journal, which perhaps might be called the *Emu*, would be established in due course. In the meantime it might be possible to arrange for a quarterly supplement in the *Victorian Naturalist*. Several gentlemen spoke on the question, however, without any pronounced expression in favour of the proposed society. Mr. J. W. Mellor, hon. secretary of the South Australian Ornithological Association, gave some account of the foundation and method of working of his society, and said that it would be glad to welcome any union of bird men. The chairman thought that, before taking any definite action, a small committee might be appointed to draw up a basis of constitution, &c., and moved that Messrs. A. J. Campbell, J. Gabriel, R. Hall, G. A. Keartland, D. Le Souëf, and himself be requested to act as a sub-committee and report to a future meeting. Mr. D. Le Souëf, in seconding the proposal, gave an outline of the objects and rules of the British Ornithologists' Union, of which he believed he was the only Australian member.

An adjournment was then made for the purpose of inspecting several very interesting exhibits brought by the visitors, and afterwards Mr. Le Souëf entertained the company with some lantern slides of scenes of bird life recently obtained by him during a trip to Riverina, thus concluding a very enjoyable evening.

BOOK NOTICE.

THE MYCETOZOA, and Some Questions which They Suggest. By the Rt. Hon. Sir Edward Fry, D.C.L., LL.D., F.R.S., F.L.S., and Agnes Fry. 82 pp., 8vo, illustrated with 22 figures. London, *Knowledge Office*, 1899. Price, 1s.

THIS little volume is a reprint from *Knowledge*, and makes known to the novice in very clear language the life-history and essential characters for classification of the interesting and peculiar group of organisms Mycetozoa or Myxomycetes, often called by the repugnant name "slime fungi," but which for common usage "mixies" is recommended by the authors. After a review of their life-history, profound biological questions that appeal not only to the specialist, but which are of general interest and deep importance to all, are ably presented, in language easily understood, under such headings as Cell Theory, Powers of Protoplasm, Motion, Death, Reproduction, &c.; also the relations of the group, about which there is a great difference of opinion, are discussed. At the close useful suggestions for study, and also the bibliography of the more important works on the subject, are given.

O. A. S.

TALEGALLUS HYBRIDS.—Writing from Southwick, Queensland, on 30th September, 1900, Mrs. Chas. Clarke says:—"In the scrubs here Scrub Turkeys, *Talegallus lathamii*, abound, and a couple of young birds were caught by Mr. Aplin. One is now nine months and the other eighteen months old. They are both male birds, and run with the domestic fowls. Last February a peculiar chicken was noticed among some hatched. It has grown into a very dainty-looking hen, with a particularly neat head, but the tail is fan-shaped, much like the turkey's. Eighteen days ago she began to lay, and has never missed a day since. She has the mound-building instinct, but is not at all careful, just covering the eggs with any rubbish. Though pure white, the eggs are not very large. The first laid was about the size of a large duck-egg. At present there are two other hybrids about a week old among the chickens." An occurrence like the foregoing seems to me worth recording.—G. A. KEARTLAND.

Field Naturalists' Club of Victoria.

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❖ OBJECTS. ❖

THIS CLUB was founded in 1880 for the purpose of affording observers and lovers of Natural History regular and frequent opportunities for discussing those special subjects in which they are mutually interested; for the exhibition of Specimens; and for promoting Observations in the Field by means of Excursions to various collecting grounds around the Metropolis.

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MOST of the Numbers from the commencement, January, 1884, can be obtained from the Hon. Sec., Mr. Geo. Coghill, 80 Swanston Street, Melbourne, at Sixpence each, or in sets (except Vols. I. and IV.), with title page and index, 6/- per volume.

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1901.

Field Naturalists' Club of Victoria.

ROOMS—ROYAL SOCIETY'S HALL, VICTORIA ST., MELBOURNE.

BUSINESS PAPER FOR MONTHLY MEETING.

Monday, 11th February, 1901, at Eight p m.

1. Correspondence and Reports.

2. Election of Members.

COUNTRY MEMBER—

Mr. St. Aloys D'Alton
C.E., Dimboola

Proposer.

D. Best

Secondér.

C. French, jun.

3. Nominations for Membership.

Members making nominations will oblige by handing the full name and address to Hon. Secretary.

4. General Business.

5. Reading of Papers and Discussions thereon.

(Authors are requested to hand in a brief resume of their papers to the Secretary.)

1. By Mr. D. Le Souëf, C.M.Z.S., "Among the Waterfowl of Riverina."
Illustrated.

2. By Mr. C. French, jun., "Natural History Notes from the Mallee."

6. Reading of Natural History Notes.

Members who may note any unusual occurrence, or see anything of interest in Foreign or Colonial papers, are requested to inform the Secretary of the same that he may arrange for their bringing them before the meeting; such notes should, however, be brief.

7. Exhibition of Specimens and Conversazione.

Members exhibiting specimens are requested to furnish the Hon. Secretary with written particulars of their Exhibits for record in Minutes and *Naturalist*.

* EXCURSIONS. *

SATURDAY, 9TH FEBRUARY.—Menzies' Creek. Leader, Mr. J. A. Kershaw. Meet at Prince's Bridge Station, 10.10 a.m. General Collecting.

SATURDAY, 16TH FEBRUARY.—Beaumaris. Leader, Mr. O. A. Sayce. Meet at Flinders Street Station, 2 p.m. Marine Zoology.

SATURDAY, 23RD FEBRUARY. Alphington. Leader, Mr. D. Best. Meet at Collingwood Station, 2.15 p.m. Entomology.

SATURDAY, 9TH MARCH.—Port Phillip. Leader, Mr. J. Gabriel. Dredging. Hour to be announced at meeting.

FIELD NATURALISTS' CLUB OF VICTORIA.

THE ordinary monthly meeting of the Club was held in the Royal Society's Hall on Monday evening, 14th January, 1901. Mr. D. Best occupied the chair, and about 40 members and visitors were present.

REPORTS.

A report of the dredging excursion on Saturday, 15th December, was read by the leader, Mr. J. Gabriel, who said that the Club was indebted to Mr. C. J. Cottell for the use of the yacht *Starlight* on the occasion. A start was made from the North Brighton pier at about 2.30 p.m., eleven members being present. The afternoon proved a very pleasant one, but, owing to the light wind, results were scarcely so good as had been expected, as time did not permit of the boat reaching the most favourable collecting grounds. Two dredges were employed, and a fair number of Mollusca, Crustaceans, and other forms of marine life were obtained. Amongst the shells found the most notable were *Meretria lamarcki* and *Cardita gunnii*, which were dredged, living, in fair quantities off Brighton Beach. Of the higher Crustaceans obtained *Ebalia* (*Phlyxia*) *intermedia*, Miers, and *Hymenosoma rostratum*, Haswell, are worthy of mention, as these forms are not included amongst our common littoral species.

A report of the excursion to the lagoons at East Kew on Saturday, 12th January, was given by the leader, Mr. O. A. Sayce, who said that, despite the inclement weather, there was a fair attendance of members, and a number of interesting captures of pond life objects were made.

The hon. librarian reported the receipt of the following donations to the library:—"Records of the Australian Museum," vol. iii., No. 8, from the Trustees Australian Museum, Sydney; "Illustrated Handbook to the Melbourne Aquarium," 1900, from the Exhibition Trustees, Melbourne; "Descriptions of Some Nests and Eggs from New Guinea," by D. Le Souëf (reprint from the *Ibis*), from the author; "Mycetozoa," by Hon. Sir E. Fry, from the publisher, *Knowledge* office, London; "Annual Report of American Museum of Natural History," 1899, from the Museum; *Queensland Agricultural Journal*, December, 1900, from Department of Agriculture, Brisbane.

ELECTION OF MEMBERS.

On a ballot being taken, Mr. Geo. F. Greenwood, "Garrell," Glen Eira-road, Caulfield, and Mr. D. Mahony, Union Room,

University, were elected ordinary members, and Mr. H. B. Williamson, State School, Hawkesdale, a country member of the Club.

EXCURSION.

The excursion to Sassafras Gully on 26th January was altered to Menzies' Creek (Gembrook line) on Saturday, 9th February.

PAPERS READ.

1. By Mr. D. M'Alpine, entitled "The First Recorded Fungus Parasite on *Epacris*."

The author described and named a fungus, *Cladosporium epacridis*, which had been found growing on the leaves of *Epacris impressa*, at Caulfield, by Mr. C. French, F.L.S.

2. By Mr. R. Hall, entitled "Notes on the Scarlet-breasted Robin."

The author gave some interesting notes on the nesting habits, &c., of the Scarlet-breasted Robin, *Petroica leggii*.

Messrs. A. Coles, A. J. Campbell, D. Le Souëf, and G. A. Kearland discussed the paper.

3. By A. J. North, C.M.Z.S., entitled "Additions to the Geographical Distribution of Australian Birds."

The author said that among some bird skins recently received from Cloncurry, in the Gulf District of Queensland, he had identified *Ptilotis keartlandi*, also *Myzomela nigra* and *Emblema picta*. Reference was also made to additional localities for other birds.

Messrs. G. A. Kearland, D. Le Souëf, A. Coles, J. A. Kershaw, O. A. Sayce, R. Hall, and A. J. Campbell took part in a discussion which followed, the latter stating that some of the records would be found in his new work, "Nests and Eggs of Australian Birds," which had just been published in England.

4. By Mr. T. S. Hart, M.A., entitled "Notes on Some Mineralogical Specimens."

The author described and exhibited a number of mineralogical specimens from the Ballarat district, which comprised several rare varieties of crystalline structure which had not hitherto been recorded as occurring in Victoria.

Mr. O. A. Sayce said he was glad to have heard the paper, and considered that the thanks of the Club were specially due to the author, as he had journeyed from Ballarat to read it himself.

5. By Mr. G. A. Kearland, entitled "Australian Desert Birds."

The author briefly described the habits of some of the more noticeable birds met with in the great desert of Central Australia.

This paper gave rise to some discussion, in which Messrs. A. J. Campbell, A. Coles, and D. Le Souëf joined.

NATURAL HISTORY NOTES.

Mr. D. Le Souëf stated that two Brush Turkeys, *Talegallus*

lathamii, had recently been hatched out at the Zoological Gardens, Melbourne.

Mr. T. S. Hart, M.A., mentioned that he had found this season a plant of *Clematis aristata* with both white and coloured flowers.

EXHIBITS.

By Mr. A. Coles.—European Hedgehog.

By Mr. C. French, jun.—Specimens of wood of *Eucalyptus melliodora*, showing ravages caused by longicorn beetles, *Phoracantha fallax*, from Gembrook, Victoria.

By Mr. C. J. Gabriel.—Shells, *Magilus antiquus*, from Mauritius.

By Mr. R. Hall.—Birds in illustration of his paper.

By Mr. T. S. Hart, M.A.—Mineralogical specimens in illustration of his paper.

By Mr. H. W. Whitney.—Wild fruits and seeds from Nyassa and Angoni Land, British Central Africa.

After the usual conversazione the meeting terminated.

EXCURSION TO FRANKSTON.

THE morning of Cup Day, Tuesday, 6th November, was not at all promising, as there had been a considerable amount of rain during the previous night, so that the small attendance on this excursion was perhaps excusable. However, on arrival at Frankston the weather improved, and an enjoyable outing resulted. Striking across the recreation ground towards Mt. Eliza the whole country was found to be a perfect flower garden, in which *Leptospermum scoparium* and *Ricinocarpus pinifolius* were conspicuous by their dazzling white flowers, while *Melaleuca squarrosa* scented the air with its rich honey-like perfume. A few insects of the commoner kinds were obtained by shaking. Crossing over some low-lying ground towards the cemetery the pretty *Utricularia dichotoma*, *Candollea calcaratum*, *Comesperma ericinum*, and other plants were seen at their best. Many years ago the beautiful pink orchid *Spiranthes australis* was to be found in this locality, but improvements have resulted in its disappearance. The singular plant *Drosera binata* grows hereabouts, along with that curious fern *Schizaea fistulosa*. *Polypompholyx tenella*, *Sebæa albidiflora*, *Drosera pygmæa*, and *D. glanduligera* grew in abundance wherever there was permanent moisture. As the clouds dispersed and the sun increased its warmth many Lepidoptera and other insects made their appearance on the wing, and proved difficult of capture. The cemetery contains a good variety of trees and shrubs, and we expected to find several good things there, but were disappointed. However, a number of larvæ, spiders, &c., were shaken from the bushes.

A few buprestid beetles, of which *Stigmodera maculata* and *S. xanthipilosa* were the most common, were taken, while some half-dead leaves of a eucalyptus, shaken into the umbrella, yielded several specimens of a pretty longicorn, *Ectosticta cleroides*. The little green beetle *Diphucephala rugosa* was very plentiful on the scrub. Very few orchids were seen, but the little plant *Comesperma calymega* reminded us that summer was rapidly approaching. Among the small Lepidoptera seen or taken may be mentioned *Hydriomena correlata*, *H. mecynata*, *Dichromodes triparata*, *Byturna inostentata*, *Euchloris dichloraria*, *Heliocausta inceptella*, *H. hemiteles*, *Peltophora privatella*, *Philobota interlineatella*, *P. herodiella*, *P. pedetis*, *P. euxantha*, *Leistomorpha ochrocausta*, *Thudaca crypsidesma*, and *Coesyra parvula*. Larvæ of *Heteronympha merope*, *Darala censors*, *Crypsiphona occultaria*, and *Prionophora ruptella* were taken, the last-named being a rather good capture. In a creek a number of small freshwater fish, probably young Galaxias, were noticed. On the whole we had a pleasant outing, and regretted that the bad weather of the early morning had prevented other members of the Club sharing in the enjoyment of the day.—C. FRENCH.

ON THE SYNONYMY OF *PACHYCEPHALA RUFOGULARIS*, GOULD, WITH *P. GUTTURALIS*, LATHAM.

BY ROBERT HALL.

(Read before the Field Naturalists' Club of Victoria, 10th Dec., 1900.)

IN consequence of the discussion on the paper, "Field Notes on the White-throated Thickhead," read by me before the May meeting of this Club, and published in the *Victorian Naturalist*, vol. xvii., p. 52, I have given some attention to the doubtful species called *P. rufogularis*, and, although convinced in my own mind, just as Mr. Campbell was, that it was simply the young of *P. gutturalis*, Lath., I was not prepared at the time to definitely say it was so.

Upon looking at the plate of the bird by the original describer, Gould, I find his coloured drawing ("Birds of Australia," fol. vol. ii., pl. 70) is wrong in a most important particular, and that the letterpress does not agree with it, and this is supported by my own observations on a large series of skins of *P. gutturalis*. Further, the description by Gould of the adult bird I consider to be too limited. He says:—"I have never seen this species of *Pachycephala* in any other collection than my own, all the specimens therein being secured in South Australia, where I found it anything but plentiful. From the little I saw of it I consider it a very solitary bird, for I always encountered it singly, and around Adelaide. Its actions were particularly quiet, and I never heard

it utter a note. The young male resembles the female. The rusty colour of the face and throat distinguish it from every other species of *Pachycephala*. I call the attention of future ornithologists to the subject."

Taking this male bird as a phase it naturally would be exceedingly difficult to duplicate it, as the rufous changes irregularly. Hence probably the reason why the ornithologists have not succeeded in finding its counterpart. Still it does not follow, as we have been exceedingly slow in securing life-histories, and such students of the birds of Australia have a wonderful field open to them. Gould practically says the bird has no vocal power. If a young bird this would be natural, and if an old bird it would, by comparison, be very unnatural.

To restrict the range to within a few miles of Adelaide would be very unusual, and Mr. Gould's idea that its stronghold would probably appear in Central Australia has not been favoured by the researches of the "Horn Expedition."

The British Museum has a specimen labelled "Tasmania," and, for reasons mentioned later, this I consider weakens the original cause. The difficulty of securing a second skin exactly like a phase that is unstable in its order of plumage development appeals to everyone, but I have one skin which is not unlike it, and others that support the affinity to it. Three phases in my collection show their colours thus :—

- (a) *Nestling, male*, 7/11/96, Heytesbury, Victoria.—Uniform rufous, excepting quills, which are partly grey and rufous in part.
- (b) *Nestling, male*, 12/1/97, Myrniong, Victoria.—In size it is about as large as the adult. Varying rufous, excepting the principal quills, which are brownish-grey. Not so deep a rufous as in (a).
- (c) *Young male*, 25/8/96, Heytesbury, Victoria, per Mr. Geo. Graham.—This is the phase referred to by Mr. Gould as the young. Certainly it is grey like the female. There is very little doubt Mr. Gould missed seeing the preceding phases, and had he secured the same specimens a month or two later (at the longest, in the same year) he would have observed the pectoral black collar appearing beneath the grey surface that has taken the place of the rufous plumage, and that, in its turn, gives way to the approaching "blacks."

In Gould's drawing I am surprised to find the rusty inner secondaries have fallen before the rusty under surface feathers, but this is surely accounted for by the letterpress reading "wings dark brown margined with greyish-brown." The colour given and shown on certain of the quills in the plate is the dull yellow

of the adult of *P. gutturalis*. The dark brown is reasonable with the phases of *P. gutturalis* in my possession. The phase (c) has the forehead and lores partly rufous and partly grey. This I make one sure connecting link between Gould's *P. rufogularis* and Latham's *P. gutturalis*. A second is that the whole of the under surface of phase (c) is losing its uniform rufous and is blotched with grey, the coming phase. Hence Gould's *P. rufogularis* is this bird just prior to the moult, and about the age of nine months.

You may notice that Gould records the young male as being like the female. Had Gould let his so-called "adult" male live for another month or two he would have seen it change into what he calls the young male, and a bird about nine months old. It is most probable that Gould never saw the phases (a) and (b), and was unaware of the changes in *P. gutturalis*.

Dr. Gadow, in the "British Museum Catalogue of Birds," vol. viii., 1883, places an observation as a footnote to the species that gives it no support as a species, and depends very much upon Gould for the descriptions of the skins. It is:—"The specimens in the British Museum are not in good condition, and I cannot state to what species, either *P. rufogularis* or *P. gilberti*, they belong; or if they are young males or females of *P. rufogularis*." One of these specimens referred to is marked as found in Tasmania. Gould did not notice the species anywhere but in South Australia. I take it, the bird referred to by Dr. Gadow is the young of *P. glaucura*, which is said to be the Tasmanian representative of the genus. Colonel Legge has noted *P. gutturalis* in Tasmania, so that there is no definite place for this young bird, judging by the feeble differences in the characters said to distinguish *P. glaucura* from *P. gutturalis*.

The British Museum key to the species refers to a black pectoral collar. This does not agree with Gould's coloured drawing or type specimen, and I have no doubt this particular specimen is just a few months older than Gould's type, judging by the development I know occurs in the young of *P. gutturalis*.

Dr. Ramsay, in his notes and references to the "Tabular List of Australian Birds," considers *P. rufogularis* is a very doubtful species, but he is not able to prove it a phase of *P. gutturalis*. Mr. A. J. Campbell, at a late date, sent a specimen to Dr. Ramsay, who exhibited it as a specimen of *P. rufogularis* at a meeting of the Linnean Society of New South Wales. Subsequently Mr. Campbell has seen, in the live state, in the bush near Lilydale, two specimens of rufous-coloured thickheads and an almost fully fledged rufous family in a nest. The nest group was without doubt the young of *P. gutturalis*, as they were being fed by the parent male of that species.

The list of Australian birds published by the Australasian

Association for the Advancement of Science, vol. vii., refers to *P. rufogularis* as probably *P. gutturalis* in immature plumage. This I believe to be the latest record of the bird prior to the "Key to the Birds of Australia," and it presents the question as an unsettled one.

The following is the order of dates when references to this so-called species were made :—

1848—Gould, Birds of Aust., fol., vol. ii., pl. 70, *id.* Hand-book.

1883—Gadow, British Mus. Cat. of Birds, vol. viii., p. 209.

1888—Ramsay, Tabular List Aust. Birds, p. 5.

1895—Campbell, *Geelong Naturalist*, vol. v., No. 2, p. 4.

1898—Australasian Assoc. Advt. Science, vol. vii., p. 137.

1899—Hall, Key to Birds Aust., p. 33.

Credit is due to Mr. Campbell for making the suggestion in the *Geelong Naturalist* that *P. rufogularis* is the young of *P. gutturalis*, additional to which I now place before you the skins—one in particular—that clearly serve as connecting links and demonstrate the plumage development of *P. gutturalis*, Lath., from the youngest nestling to the fully adult male and female. The detail descriptions of these phases appear in the "Proceedings of the Royal Society of Victoria," vol. xiii. (new series), part i., 1900.

A VISIT TO THE RIVERINA DISTRICT, NEW SOUTH WALES.

BY D. LE SOUËF, C.M.Z.S.

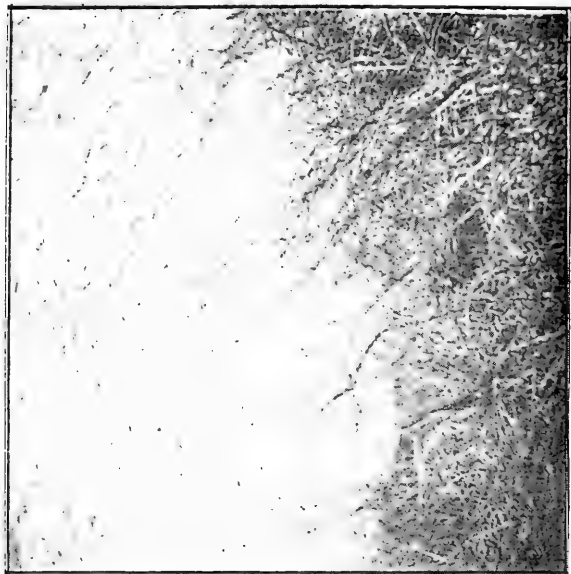
(Read before the Field Naturalists' Club of Victoria, 10th Dec., 1900.)

THIS district has this year been blessed with a fair rainfall, and the Murray River was high at the time of my visit, consequently the various lagoons near its banks were filled with the overflow of its waters, and also sufficient rain fell on the plains to fill the different swamps, which enabled wildfowl to breed, for, as is well known, Waders and other waterfowl will not nest unless there is a sufficient amount of water to meet their requirements; so in a dry season, such as has previously been in this district, the various breeding grounds of the Cormorants, Herons, &c., were practically deserted, as the birds would probably not have been able to find sufficient food for their young when hatched, as a dry season means a great dearth in insect life.

I now purpose describing and illustrating a little of the bird and other life that I noticed in this interesting district, in the neighbourhood of Deniliquin, when I visited it in October last. The principal food supply of many of the birds is caterpillars and grasshoppers. The former are very plentiful in August and Sep-

tember, generally disappearing during the latter month, although in a favourable season they are in evidence longer, as they were this, for instance. They are largely eaten by Ibis, Crows, &c. Grasshoppers lay their eggs about December; they make small round holes, larger at the bottom than near the surface, and from half to three-quarters of an inch deep, and when laying the female inserts her abdomen into the hole up to the base of the wings, and several grasshoppers gather round her and seem to hold her down while she is laying. The eggs are elongated, and dirty white in colour, and number from five to twelve. They are laid in an upright position, forming a bunch, and adhering loosely one to the other. The young, when hatched, come out of the top end of the egg, and work their way up through the ground to the surface. The female grasshopper always seems to choose hard, bare patches of ground in which to make her burrows, and it seems a wonder how she can do it at all when the ground is often so dry and hard. The young generally hatch early in October, in countless numbers; they grow quickly, and can fly towards the end of November, and I was glad to notice that the Rose-breasted Cockatoos, or Galahs, *Cacatua roseicapilla*, who are generally regarded as the farmers' enemy, have some good points in their favour, as they dig up the grasshoppers' eggs with their beaks and devour large quantities of them. The birds seem to know instinctively where the eggs are, and it would be interesting to know how they first acquired the habit of searching for them—possibly by first having found the eggs when they pulled up the roots of several plants on which they feed, for, as is well known, these birds feed almost exclusively on the ground; it is probable that the Long-billed Cockatoo, or Corella, *Licmetis nasica*, and the White Cockatoo, *Cacatua galerita*, do the same thing.

The most interesting sight seen was a colony of the Straw-necked Ibis, *Carphibis spinicollis*, nesting in a swamp of about 600 acres, which was covered with Lignum (*Muehlenbeckia cunninghamii*) bushes from six to ten feet high, and in which the water was from two to three feet deep. The birds occupied about 400 acres, and it was an interesting sight watching the various companies continually leaving and returning; some flew high, others again low, and each flock numbered from three to about forty birds. As the swamp was approached, a curious sound, something like breaking surf on the shore, was heard, caused by the immense numbers of birds flying about and emitting their hoarse cry; but comparatively few birds were seen flying above the Lignum, and one could not tell that such a vast host of birds were nesting there. And after having been all through the swamp and carefully noted the numbers on a small area, both Dr. C. Ryan and myself, as well as the manager of the station on which the



Negative by D. LE SOUEF.

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**FLIGHT OF STRAW-NECKED IBIS,
RIVERINA, N.S.W.**



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**NESTS OF STRAW-NECKED IBIS,
RIVERINA, N.S.W.**

birds were, came to the conclusion that the minimum number was 200,000. Of course, only one-half of the birds would be in the swamp at one time, as the other half would be away feeding. No illustration we could show would give much of an idea of the number of birds or extent of the rookery, unless a photo. was taken from a balloon or some such eminence, for even when a gun was fired off only those in the immediate vicinity—say, of sixty yards—would rise, and not even all those unless they caught sight of the intruder; they would then circle round at a considerable height up, but would soon settle again. The noise of the wings of the birds as they flew past was similar to the rustling of silk. The Ibis which first arrived started nesting in the middle of the swamp, and as fresh arrivals came so they had to build on the outskirts of those there before them, consequently the centre nests would have fully fledged young ones in, while at the outskirts late arrivals were only building.

On entering the swamp trodden-down Lignum bushes would soon be met with, from which a few birds would fly away. Then would be passed fresh nests built with green twigs of Lignum, then again nests with one egg in each, and as we proceeded two eggs would be noticed in each nest, then three, the usual complement. Further still they would be found hatching, and as the eggs hatch in the order they are laid, eggs and very young birds would be noticed in the same nest. As we proceeded young in different stages would be noticed, which, on being disturbed, leave their nests and crowd up together, and readily climb over the Lignum and take to the water if approached too closely. They then swim to neighbouring bushes, and, although they are not web-footed, they swim well and high. The parents feed them by placing partially digested food in their mouths, which food consists of grasshoppers, caterpillars, freshwater snails, &c., and if the young birds are handled much they occasionally eject the food from their stomach. The contents of an average crop of an adult bird contained by actual counting 2,410 young grasshoppers, five freshwater snails, several caterpillars, and some coarse gravel, which, if you multiply by 200,000, brings up a big total of 480,000,000 odd grasshoppers, as well as vast numbers of caterpillars and snails, and also these latter are the host of liver fluke, which sheep so easily get in certain damp localities; and one must remember that this is going on every day, so a little idea can be formed of the immense utility these birds are in destroying noxious insects. Then, again, the average number of young is about $2\frac{1}{2}$ to each pair of parent birds, and the contents of their stomach must reach an enormous total, as they all seemed gorged with food. Crows, or rather the Australian Ravens, *Corone australis*, occasionally eat the eggs and young of these birds, but not often, as only four instances of it were noticed.

Mr. A. J. Campbell has received a note from Mr. Tom Carter, in which he states that the Straw-necked Ibis were nesting inland from Carnarvon, in Western Australia. He says :—"Just been to look at the Straw-necked Ibis; about 200 nests, lined with dry gum leaves, and mostly built on acacia bushes bent over by flooded creek, but some built on ground that had been a small island. In some places were six or seven nests, all touching and interbuilt. The young were nearly all fledged, but I got a good many addled eggs, which vary much, some long ovals, others round ovals; clutch three. There were also White Ibis about, but I did not find their nests."

Ravens were plentiful, and were frequently seen on the plains feeding on caterpillars and other insects, or congregating on some single tree, apparently holding a meeting, where all tried to talk at once; they nested anywhere, either high up in the trees or in Lignum or similar bushes, and occasionally on the ground itself, with no shelter anywhere near. Sometimes their nests are found in a dried skeleton of a sheep, the birds using the wool to construct their home with; they usually use the same nest year after year. They are cordially disliked by settlers on account of their weakness for eating out the eyes of weakly lambs or their mothers, for if a sheep is down and too weak to rise, as they frequently are in times of drought, Ravens will often pick the uppermost eye out, but when the sheep is lifted up by human agency they can then feed, and often recover, minus one eye. A pair of Swamp Hawks, or Spotted Harriers, *Circus assimilis*, were noticed sailing over the swamp, but the Ibis did not take much notice of them. We found two nests of these Harriers, one with four fresh eggs in and the other with young. They were both built in small Lignum bushes, about two feet from the ground, surrounded by a shallow and partially dry swamp, about four miles from the Ibis swamp, and we saw one strike and carry off a half-grown Red-necked Avocet, *Recurvirostra novæ-hollandiæ*, but after a sharp run we made the bird drop its prey, and were able to secure it, but it died shortly afterwards. These Avocets were numerous in shallow neighbouring swamps, and had evidently almost finished nesting, as many young birds were seen and old nests noted, but one was found that contained four eggs, and they were on the point of hatching. The nest was a flat structure, built on very damp ground, close to the edge of the water, and composed of short pieces of stick. The parent bird tried hard to draw us away from her nest with the usual antics of pretending to be wounded, &c. The other birds were noisy, flying overhead and uttering their plaintive cry, evidently concerned with the safety of their young. A few White-headed Stilts, *Himantopus leucocephalus*, were noticed flying with them. Native Companions were frequently seen, but always near

water or damp ground. Two nests were found. These structures are generally placed on a small mound surrounded by water, either being made of a few short sticks or coarse grass, but where the situation is very low and wet the birds then build it up higher with herbage, so as to keep the nest comparatively dry. The birds can see a considerable distance over the plains, and long before the intruder is near the sitting bird has left her nest of two eggs and stalked off; they seldom fly if they can help it, and one can get close to them if driving or on horseback. The eggs are sometimes left a long time uncovered if the birds are disturbed, and they never seem to be in a hurry to go back to them. These birds are in pairs throughout the nesting season and are very local, but during the winter the old and young birds collect together in flocks, and it is then that they go through their dances and other antics.

Black Swans, *Chenopsis atrata*, were numerous and their nests often found; the usual complement of eggs was six; they either built floating nests in the Lignum on the larger sheets of water or among the rushes and coarse grass in the smaller swamps, and when their little ones were able to travel they took them to the larger waterholes, which were not likely to dry up so soon, and it was an interesting sight to see the parents and their brood waddling over the plain to some lagoon, in consequence of the one they had left having nearly dried up. If the family were disturbed in a small waterhole, the male bird generally flew up and circled round the intruders and then returned to the others, but one always stayed with the young, unless approached too close, when both took to flight, but would not go far.

Ducks were numerous, and nests containing ten eggs each were found of the Black Duck, *Anas superciliosus*, Grey Teal, *Nettion gibberifrons*, and White-eyed Duck, or Hard-head, *Nyroca australis*. These birds were generally on the smaller swamps, but on the Ibis swamp many pairs of Shovellers, *Spatula rhynchotis*, were seen; most of them had their broods of from eight to ten little ones with them. A male Pluméd Whistling Duck, *Dendrocygna eytoni*, was seen on a dam, but the nest could not be found; anyhow, a few days after we had left both birds with their brood were noticed on the water. Several lots of young Maned Geese, or Wood Duck, *Chenonetta jubata*, were seen on the water-courses, as at the time of my visit the majority of the waterfowl had hatched their young. The Black-tailed Tribonyx was nesting on the Ibis swamp and other places, but only nests from which the young had been hatched were found; they were very active, and can run fast and dodge among the bushes, but will not take to the wing if they can help it.

In consequence of the Murray River having been high this year, the various swamps near its banks were filled, therefore in

the dense thickets of high timber in them many birds were nesting, and they included Spoonbills, *Platibis flavipes*, Australian Egrets, *Herodias timoriensis*, Nankeen Herons, *Nycticorax caledonicus*, Glossy Ibis, *Plegadis falcinellus*, Pacific Herons, *Notophôyx pacifica*, White-fronted Herons, *Notophôyx novæ-hollandiæ*, Black Cormorant, *Phalacrocorax carbo*, Little Black Cormorant, *P. sulcirostris*, Pied Cormorant, *P. hypoleucus*, and the White Ibis, *Ibis molucca*. Many of these birds nest together in large rookeries in suitable localities, and often number many thousands of birds, the Cormorants especially being plentiful. Eggs of all the above have been taken by one and another this season, but fortunately these nesting places are difficult to get at, both in consequence of the boggy nature of the ground and the way the water is obstructed with fallen timber, to say nothing of the clouds of vicious mosquitos that assail any who dare to invade their domains.

Nankeen Herons generally build their stick nests high up in eucalyptus trees, but last week I received an interesting letter from my brother, Sherbourne Le Souëf, in which he describes a visit to a nesting colony of these birds on a small island off the coast of Western Australia. I cannot do better than quote his words, as I have never heard of these birds nesting in a similar place before :—" We next went to what they told me was an Ibis rookery, but the birds turned out to be Nankeen Herons, and as we approached the island about a hundred birds rose up, and on landing I soon came across the nests. There were eggs and also young birds in all stages, but they required looking for, as they were all built upon the ground and well hidden under thick undergrowth. The nests were composed of a few sticks, lined with roots and leaves, and were about a foot in diameter and from one to two inches high. The average clutch was three, but in one case I got five, and in two cases two eggs."

But to return to Riverina. Cormorants were not often noticed at the waterholes on the plains, but, curiously enough, these holes or depressions frequently contain fish, even when they are only filled by drainage from the plains, and have no connection with any stream or overflow. The spawn of the fish is probably carried on the feet of aquatic birds. We were shown a small waterhole like those described, in which our informant said he had found a bream weighing 5 lbs., which was floundering about in the mud as the water dried up, and that the hole had only had that supply of drainage water in for three years, as before that it had been perfectly dry for a season. It shows how fast the fish grew with the abundance of food it must have had. The dried remains of other fish have often been found in empty waterholes. This district has been subjected to severe droughts of late years, consequently most of the Emus and

Kangaroos have perished, and we only saw five of each. In the garden of the house in which we were staying, a pair of Restless Fly-catchers, *Sisura inquieta*, had built their cobweb-covered nest near the top of a Pepper tree, and on the trees round about the house Spiny-cheeked Honey-eaters, *Acanthochcera rufigularis*, and Brown Tree-creepers, *Climacteris scandens*, were very plentiful, and a pair of *Cinclorhamphus cruralis* evidently had their nest in a patch of long grass not more than ten yards away from the buildings. We only heard a Pallid Cuckoo, *Cuculus pallidus*, once. It is strange that this bird, which is usually so plentiful, should this year be conspicuous by its absence, both in Victoria and New South Wales; possibly the terrible drought in the Central Queensland districts may have hindered its migration southward. It was noticed that the English Sparrows were becoming plentiful near the homestead, and they seem to have the habit of driving many small native birds away. The most conspicuous birds, and also the most noisy, were the Galahs, or Rose-breasted Cockatoos, *Cacatua roseicapilla*; but one was never tired of seeing these beautiful birds feeding on the ground in flocks. They nested in the hollows of the tall Eucalyptus trees near the river, and their place of abode was easily recognized by the habit they have of taking the bark off the tree at the entrance to the hollow, but for what reason I do not know.

In certain spots under the shade of trees the Topknot Pigeon, *Ocyphaps lophotes*, was sure to be seen; they were very tame, and only when approached very close would they fly away with a whirr. Fairy Martins, *Petrochelidon ariel*, were abundant in places, and they nested in small colonies of from ten to thirty birds, and generally built their retort-shaped mud nests on the lower side of the large dark-coloured excrescences that are found on the Red Eucalyptus trees, and they prefer choosing those trees that are growing either in or near water, probably because their food supply of mosquitos and similar insects are more abundant there.

During the summer, when the country is very dry and mostly bare of grass, strong winds sweep over the plains and raise heavy dust storms, and this dust and sand blowing against the wire fences along with dried grass and other vegetation gradually forms a mound as high as the fence itself, rendering the latter useless.

When at Deniliquin we were shown a White Cockatoo, *C. galerita*, that belonged to Dr. Noyes of that town, that had the curious habit every night when it went to sleep in its cage of first inverting and placing on his head with his foot a round empty tin about three inches deep. There was a hole on one side, which he carefully placed opposite his eye, so that he could see what was going on, if necessary, even though he had his

nightcap on ; and, also, we were told that occasionally he would put it on during the day if he got teased much and wanted to be left alone.

[This paper was illustrated with a series of thirty-four limelight views.—ED. *Vict. Nat.*]

THE FIRST RECORDED FUNGUS-PARASITE ON *EPACRIS*.

BY D. M'ALPINE, Government Vegetable Pathologist.

(Read before the Field Naturalists' Club of Victoria, 14th Jan., 1901.)

TOWARDS the end of August I received from Mr. C. French, F.L.S., specimens of *Epacris impressa*, Labill., obtained at Caulfield, the plants having a general unhealthy appearance, and the leaves of an ashy-grey tint. Large areas were thus affected, and the disease was evidently destroying the plants, especially the top parts of the young shoots, and causing them prematurely to shed their leaves.

The cause of the disease turned out to be a fungus, and as this is the first time, to my knowledge, that any fungus growth has been found on *Epacris*, the fact is worthy of special record.

It is evidently about this season that the fungus is attaining its full development, for on the 22nd of July Mr. French collected specimens in which the ashy-grey appearance of the leaves was evident, but no definite fructification of any fungus could be found. He was, however, certain that a serious disease was attacking the plants, and sent me more specimens on the 27th August, when I found the fruiting stage of the fungus.

The leaves of the *Epacrideæ* are stiff and harsh, and from their very nature rather unfavourable to fungus-life, hence their comparative freedom from parasites of a fungus nature. Cooke found a new fungus, *Nectria ferruginea*, on the living leaves and bracts of a species of *Styphelia*, from Omeo, and this is the only instance recorded in Australia.

The plants affected by *Cladosporium epacridis*, n. sp., are readily distinguished from healthy plants by the ashy-grey appearance of the leaves, which often fall away and leave the stem bare. Some of the diseased specimens bore flowers, which were evidently retarded in their development.

CLADOSPORIUM EPACRIDIS, n. sp.

Tufts globose, compact, minute, punctiform, black, scattered, bursting through upper surface of leaf, which is ashy-grey, average 120 μ broad.

Hyphæ clustered and forming a glomerule, olivaceous, septate, branched, average 4 μ diam.

Conidia similarly coloured or paler, elliptic-oblong, 1-septate, slightly constricted at septum, one half usually broader than the other, finely granular contents, $15 \times 5\frac{1}{2}$ —6 μ .

On living leaves of *Epacris impressa*, Labill. August, 1900. Caulfield (C. French, F.L.S.)

The creeping hyphæ ramify through the tissue of the leaf, and ultimately protrude through the epidermis.

This species differs from *C. epiphyllum*, Mart., in appearing on the upper and not usually on the under surface of the leaf, in the more or less globose tufts, and in the regularly 1-septate spores.

ADDITIONS TO THE GEOGRAPHICAL DISTRIBUTION OF AUSTRALIAN BIRDS.

By ALFRED J. NORTH, C.M.Z.S.,
Ornithologist, Australian Museum, Sydney.

(Read before the *Field Naturalists' Club of Victoria*, 14th Jan., 1901.)

RECENTLY Dr. W. Macgillivray, of Hamilton, Victoria, has kindly sent me for inspection some bird skins collected by his brother, Mr. A. S. Macgillivray, at Leilavale station, on the Fullarton River, near Cloncurry, in the Gulf District of Queensland. The pallid appearance of many specimens from this torrid part of the country is remarkable when compared with examples of the same species from the southern half of the continent. In this respect it resembles the avi-fauna of North-West Australia, many species of which are common to these two widely separated districts.

Ptilotis keartlandi was one of the novelties secured in 1894 by the Horn expedition in Central Australia. Later on, in 1896-7, Mr. G. A. Kearthland, while a member of the Calvert Exploring Expedition, obtained four more specimens near Derby, King Sound, thus extending its range to North-West Australia. It was also observed by the members of the expedition south of Separation Well in Western Australia. It is with pleasure that I again observed an example of this species in the collection formed by Mr. Macgillivray in the Gulf District of Queensland, thus extending the range of this comparatively recently described bird almost across the northern portion of the Australian continent. Another honey-eater in the collection is *Myzomela nigra*, which hitherto, I believe, has not been recorded from Queensland. *Emblema picta* is yet another addition to the avi-fauna of the Gulf District. For many years this species was regarded only as an inhabitant of the northern and north-western portion of the continent, but from specimens procured of comparative recent date its range has

been extended to Central Australia* and New South Wales.† I was somewhat surprised to meet with a skin of *Ephthianura aurifrons* from this district, as it has not been recorded either by Gould or Dr. Ramsay from Queensland. The type of *E. crocea* was obtained by Mr. Gulliver at Normanton, not very far distant. There were several skins of *Ptilotis leilavalensis*, also a set of three of its eggs taken by Mr. A. S. Macgillivray, and from the same nest an egg of the Pallid Cuckoo, *Cuculus pallidus*.

From Mr. Tom Carter I have received for identification a skin of *Acanthiza uropygialis*, obtained by him at Point Cloates, Western Australia; hitherto this species has not been recorded from the western portion of the continent.

While recently at the National Museum, Melbourne, I examined a skin of *Graucalus hypoleucus* that was obtained by Mr. J. L. Ayres about 100 miles east of Wyndham, on the Cambridge Gulf, North Australia. The nearest locality to the above in which this species has been recorded is Port Darwin, in the Northern Territory of South Australia.

Mr. J. A. Thorpe, the taxidermist of the Australian Museum, Sydney, has also kindly brought me for examination a mounted specimen of a young male *Lamprolaima superbus* that was shot on the 14th March, 1900, at Boloco station, Buckley's Crossing, New South Wales. This is situated in the Snowy River district, near the southern boundary of the colony, and over 2,000 feet above the level of the sea. In the "Old Collection" of the Australian Museum is a specimen of this bird marked "*Ptilinopus superbus*, North Shore, Sydney," a locality which Dr. Ramsay regarded with very much doubt as to its accuracy, for in his "Tabular List of Australian Birds" he did not record this species from farther south on the Australian continent than Port Denison in Queensland. The present specimen of *L. superbus* is the only properly authenticated one I have seen that was obtained in New South Wales.

The above brief notes refer only to specimens that I have very recently examined. Full reference will be made to other additions in "Australian Museum Catalogue—Nests and Eggs of Australian Birds," new edition, part i., now in the press. While, however, on the subject I may as well mention that among specimens sent me for examination *Gerygone culicivora* has been obtained near Bourke, also its nest and eggs for the past two seasons near Dubbo; *Strepera fuliginosa* and *Ptilotis ornatus* near Booligal; and *Tadorna radjah* on the Macquarie River, near Narramine. I also observed a flock of the latter birds on the Gwydir River in November, 1898.

* Rep. Horn Expl. Exped., pt. ii., Zool., p. 88 (1896).

† Rec. Aus. Mus., vol. iii., p. 14 (1897).

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VOL. XVII.—No. II.

MARCH, 1901.

The Victorian Naturalist :

THE JOURNAL AND MAGAZINE

— OF —

The Field Naturalists' Club of Victoria.

PUBLISHED 7th MARCH, 1901.

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The Author of each article is responsible for the facts and opinions recorded.

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1901.

Field Naturalists' Club of Victoria.

ROOMS—ROYAL SOCIETY'S HALL, VICTORIA ST., MELBOURNE.

BUSINESS PAPER FOR MONTHLY MEETING.

Monday, 11th March, 1901, at Eight p.m.

1. Correspondence and Reports.

2. Election of Members.

	Proposer.	Second.
Mr. Cuthbert C. Wallis .. Toorak Rd., Toorak.	H. T. Tisdall ..	J. A. Kershaw
Mr. Fullard .. Lyndhurst Crescent, Hawthorn.	O. A. Sayce ..	W. Stickland

3. Nominations for Membership.

Members making nominations will oblige by handing the full name and address to Hon. Secretary.

4. General Business.

5. Reading of Papers and Discussions thereon.

(Authors are requested to hand in a brief resume of their papers to the Secretary.)

1. By Mr. J. A. Kershaw, F.E.S., "Notes on *Mochlotona prasmatis*." A rare Victorian Moth.
2. By Mr. A. J. Campbell, "A New Wren (*Malurus*)."
3. By Mr. W. Macgillivray, "Some North-west Queensland Birds."
4. By Mr. D. Best, "A Trip to the Mallee and the Grampians."

6. Reading of Natural History Notes.

Members who may note any unusual occurrence, or see anything of interest in Foreign or Colonial papers, are requested to inform the Secretary of the same that he may arrange for their bringing them before the meeting; such notes should, however, be brief.

7. Exhibition of Specimens and Conversazione.

Members exhibiting specimens are requested to furnish the Hon. Secretary with written particulars of their Exhibits for record in Minutes and *Naturalist*.

* EXCURSIONS. *

SATURDAY, 23RD MARCH.—Zoological Gardens. Leader, Mr. D. Le Souef, C.M.Z.S. Meet there at Main Gates 2.30 p.m. Zoology.

THE

Victorian Naturalist.

VOL. XVII.—No. 11. MARCH 7, 1901.

No. 207.

FIELD NATURALISTS' CLUB OF VICTORIA.

THE ordinary monthly meeting of the Club was held in the Royal Society's Hall on Monday evening, 11th February, 1901. The president, Mr. J. Shephard, occupied the chair, and about 50 members and visitors were present.

REPORTS.

A report of the excursion to Menzies' Creek on Saturday, 9th February, was read by Mr. H. T. Tisdall, who said that the locality proved very disappointing, little of interest being noticed. However a freak of nature, which might be worth recording, was a tree fern almost completely enveloped by the stems of a blackwood, *Acacia melanoxylon*, no less than seventeen being counted, varying from three to six inches in diameter. Insects of every description were scarce.

The hon. librarian acknowledged the receipt of the following donations to the library:—"Report on the Utilization of Brown Coal" and "Report on Mt. William Goldfield," &c., from Department of Mines, Victoria; "Annual Report Botanic Gardens and Domain, New South Wales, 1899," from the Government Botanist, Sydney; "Annual Report Department of Agriculture, Queensland, 1899-1900," and *Queensland Agricultural Journal*, December, from the Department of Agriculture, Brisbane; "Proceedings Linnean Society of New South Wales," vol. xxv., part 3, 1900, from the Society; "Proceedings Royal Society of South Australia," vol. xxiv., part 2, from the Society; "Journal of Mueller Botanic Society, Western Australia," from Mr. Alex. Purdie, M.A.; *Nature Notes*, December, from Selborne Society, London; *Science Gossip*, December, and *Knowledge*, December, from the proprietors.

ELECTION OF MEMBERS.

On a ballot being taken, Mr. St. Aloys D'Alton, C.E., Dimboola, was elected a country member.

PAPERS READ.

1. By Mr. D. Le Souëf, entitled "Among the Waterfowl of Riverina."

The author gave an interesting account of the nesting habits of a number of birds, principally waders, found breeding in the swamps near the Murray, and illustrated his remarks with a series of about twenty lantern slides.

Mr. E. H. Swan took the opportunity of showing a few lantern

slides to illustrate micro-photographic work he had been doing recently.

A vote of thanks was accorded to Mr. Haines for the use of and working the lantern.

2. By Mr. C. French, jun., entitled "A Naturalist in the Mallee."

The author gave some account of the more interesting plants, birds, and insects met with in a trip from Hopetoun towards Lake Albacutya and Pine Plains.

This was discussed by Messrs. Le Souëf, Kearthland, Coghill, and others.

NATURAL HISTORY NOTES.

Mr. G. A. Kearthland stated that most naturalists consider it takes four years for Barraband's Parrakeet to acquire its full plumage, but that he had one which was in the egg on 6th November, 1899, and is now in nearly full adult plumage.

Mr. F. G. A. Barnard mentioned that a few nights ago he had been disturbed by a Flying Squirrel which had got into his house at Kew.

Mr. A. J. Campbell said that he had been advised by his son, Mr. A. Campbell, that the Magpies had proved very destructive to fruit this season at Rutherglen.

EXHIBITS.

By Mr. C. J. Gabriel.—Shells, *Limopsis rubricata*, from Western Port, Victoria (found in Polyzoa); also, *Cypræa testudinaria*, from Mauritius.

By Mr. G. E. Shepherd.—Eggs of Red-necked Avocet, from South Australia; White-headed Stilt, from New South Wales; Banded Stilt, from New Zealand.

By Mr. Chas. Walter.—Grass, *Panicum sanguinale*, L., from Snowy River, East Gippsland (new locality). Collected by Ed. E. Pescott, Orbost.

After the usual conversazione the meeting terminated.

NOTES ON SOME MINERAL SPECIMENS EXHIBITED.

By T. S. HART, M.A.,

Lecturer on Geology, School of Mines, Ballarat.

(Read before the Field Naturalists' Club of Victoria, 14th Jan., 1901.)

THE following observations on some Victorian mineral occurrences are recorded after consulting the late Prof. Ulrich's "Essay on the Mineralogy of Victoria" (Exhibition Essays, 1867), and Mr. J. A. Atkinson's "Locality List of all the Minerals Hitherto Recorded from Victoria" (Proceedings Royal Society of Victoria, vol. ix., new series).

I. PYRITE.—Minute crystals on quartz, showing, when magni-

fied, cube and octahedron in combination, Victoria United Mine, Ballarat East. These, from their appearance, due to the large number of small, somewhat tarnished faces, have been called copper pyrites by the miners. Cubes, octahedra, and pentagonal dodecahedra (or pyritohedra) are forms of this mineral already recorded from Victoria, but the combination of these two forms, as exhibited, is not explicitly mentioned in either of the above papers.

Crystals on Dolomite in quartz, South Star Mine, Sebastopol, near Ballarat. These show combinations of cube and octahedron sometimes with faces of a dyakis dodecahedron or diploid. I find no previous mention of this crystal form from Victoria.

Groups of Pyrite cubes from the mullock-heap of the Great Buninyong Estate Co.'s 1898 shaft. These were in soft, decomposing state, and were surrounded by smaller crystals of Pyrite in non-coherent clusters. No regular arrangement of the cubes is observed.

Compact ovoid aggregates of crystals of Pyrite in slate, from a mullock-heap of one of the Midas group of mines at Bald Hills, north of Ballarat. One of these aggregates is ground to a smooth surface in the direction of its length and shown to be compact and finely crystalline throughout.

Slate with Pyrite cubes from Castlemaine. In splitting the cubes were found to persistently adhere to the one side of the slate, so that specimens show projecting crystals on the one side and impressions on the other.

II. PYRRHOTITE and CHALCOPYRITE.—In granite from a quarry at the Gong Gong Reservoir, near Ballarat. These minerals occur along lines in the granite, and the latter occasionally disseminated, especially in fine-grained patches of the granite.

In an outcrop of granite about a mile south, at Warrenheip, Molybdenite occurs.

III. CALCITE and ARAGONITE.—In basalt from the railway cutting at Warrenheip station.

The Aragonite is in simple crystals, prism with brachypinakoid faces largely developed, sometimes making crystals like flat blades with bevelled edges. The crystals are in diverging tufts, and are terminated by macrodomes and brachydomes. Well-developed terminations are not common in the Aragonite in our basalt (Ulrich).

The Calcite is in globules and in cylindrical rods attached to the walls of the cavities at both ends. These rods, when broken are seen to possess a triad symmetry in their structure as shown in the cross section, agreeing with the symmetry of the Calcite crystal.

IV. Dendritic markings of Oxide of Manganese on the Calcite coating the cavities in basalt from the Yarra new cut, near the Botanical Gardens bridge.

V. CHABAZITE.—Minute crystals of a zeolite, showing a typical form of Chabazite. Twin rhombohedra, almost cubes, the twin axis being the triad axis. In basalt from Lilydale. The occurrence is similar to those at Malmsbury and Pentland Hills, and Professor Ulrich's figures show similar rhombohedra modified on the edges and twins of different aspect from Malmsbury.

VI. ORTHOCLASE.—In granite from a small outcrop south of the State School, Addington. The crystal is a typical simple crystal, showing prism, clinopinakoid, base and orthodome. A marked difference of appearance is noticed in the faces of different crystallographic forms.

VII.—SCHORL.—From the same locality. This is noticed on the Learmonth Geological Map (Norman Taylor), but is not mentioned in either of the above lists.

VIII. A reputed Cinnabar specimen from Western Victoria. This was obtained from Mr. H. S. Edgar (Pine Hills, near Balmoral), and is stated to be the identical specimen referred to as a rich mercurial ore in a report on that district in Progress Report No. 9 of the Geological Survey of Victoria. The circumstances (obtained from Aborigines and used by them for painting) are the same. On examination it proves to consist essentially of red lead and oil.

NOTES ON THE SCARLET-BREASTED ROBIN.

BY ROBERT HALL.

(Read before the Field Naturalists' Club of Victoria, 14th January, 1901.)

MANY portions of the life-history of the Scarlet-breasted Robin, *Petræca leggii*, Sharpe, are of much interest. Their dissociation from the fellow species, the Flame-breasted Robin, *P. phænicea*, Gld., at one time, and the dissociation of their own sexes at another, in addition to the nidification and their general bearing to the young throughout the year, are such points. To towns-people Robins generally make their appearance in the open during April, but it is greatly a matter of the nature of the season, as you may find them appear early in March (6/3/97, Box Hill). Just such a March as we had last year brings them to us, because it was so quickly followed by winter weather.

The males of both species tune their lays upon their arrival in the open. *P. leggii* comes out of the adjacent woods, but *P. phænicea* has travelled from the dense and quiet mountain tracts to find the open. Though this is the rule I am well informed that *P. leggii* will ascend near to the highest heights, such as Kosciusko, 7,000 ft., or sometimes above it, and become companionable with but another daring bird, the Pipit. I observed both on the Dargo Plateau, 5,000 ft. above sea level, on 18th February, 1895.

Judging by the large amount of singing that is done by the male (the females are almost mute) in April and May, and the apparent anxiety of each male to please a female, including the combats of jealous males, I should think the arrangement to mate was then being made. In the winter the males, for a time, become dissociated from the females and young. This I judge by seeing twenty-one adult males by themselves in a flock (25/6/97). At the moment I wondered why such should be, and whether they had actually arranged their nesting partners for the following August. How the twenty-one males would know their partners again is an interesting problem, and why the females leave the males at this time is another.

The young of the past season, soon after leaving their nests, are placed upon their own resources, and for about a year keep to the cover. It is not unlikely that on account of the pugnacity of the male the young males have to keep away, and the female or females of the same brood keep it or them company. The adult male shows fight to every young male (even only a few months old) or adult that approaches it when there is one or sometimes two females about it. At certain times many males and females (possibly young too) associate on the same field, and the "redbreasts" show ordinary jealousy; this simply means a deal of fuss and "clipping of shears" noise.

It is not improbable the young follow their parents or take up the rear to the van. When July arrives I also think that the mass of the females of a certain district join the mass of the young, and for a few weeks enjoy themselves under the amalgamation. I have seen quite a score of these plain-plumaged birds upon a refuse hillock, surrounded by timber, and quietly working for their daily bread. The success varies with them just as it does with the opportunity and efforts of every other living thing. In this respect the season governs the supply, and the birds either know it (inherently) or learn from the most severe though best of all teachers—experience.

Both Robins, *P. leggii* and *P. phoenicea*, traverse together the same fields in winter and feed upon the same nature of foods: but when August comes both leave the open, the former simply keeping to the environment of the well-grassed lands. It rarely beats the innermost covert to see what it would yield.

My experience of the times when nest-building starts has been: At Box Hill, 1/9/94 and 26/10/94; at Dandenong, 19/9/86; at Bayswater, 24/11/94 (per Mr. Joseph Gabriel). In the first case I found the nest remained to be lined internally, and when I approached it the owner retired shyly to a distance. In the second case one egg was in it, but upon examination the following day it was broken, and the ants were carrying it away so early. It occurred to me the female bird was irritable, and perhaps

unwisely broke the egg, just as other species of birds have been known to do—the Blue Wren, *Malurus cyaneus*, and the Black Duck, *Anas superciliosus*. As a matter of fact, subsequently I handled two eggs of a pair of the same species, and the following day they were thrown out. This demonstrates to me the sensitiveness of one or both of the sexes, probably the female, as it is she that does all the building of the nest, and, of course, all the laying of eggs, so any interference beyond that of her partner would naturally frighten so timid a bird as she is at this time of the year. While the 24th November nest had three fresh eggs in it, the 19th September nest had three fledglings. A second, or more probably a third, brood was in the former nest.

Mr. George Graham, of Heytesbury Forest, has observed for me during the past season the following nesting actions of a pair:—"On 10th August the female commenced to build a nest twenty feet from the ground, and in a small fork of a eucalypt. It compactly built the frame of it with strips of "messmate" bark and cobwebs. On the 18th inst. a lining of rabbits' fur and feathers, &c., was commenced; finally the nest agreeing so well with its surroundings that it was difficult to detect. On the 30th inst. the first egg was laid, and the second on the 31st inst. The young hatched out on the 16th September, the crown, back, and shoulders being mostly covered with light-grey down. On 23rd September the wing quills and the feathers of the back appeared. On the latter day the young disappeared, but not of their own accord, as the eyes were not quite, though nearly, open. By analogy the young should have remained in their nest two days longer. The nest being tilted, I righted it, and waited for the owners. In the meantime I watched a Laughing Jackass, *Dacelo gigas*, perched near me, and read enough by its actions to form the opinion it was the culprit. Both parents soon returned, the male, with a worm in its bill, following the female, which quietly flew into the nest, and settled down upon it as if covering the tender brood. The mother now rose with a pang of surprise at not finding its young, and the parents then flew round in a very much distressed state of mind. With this I left them."

Mr. Graham says the female does all the work of incubation, and as it builds the whole of its nest, it would be interesting to know if the male does all the feeding. It certainly does some. Two young birds kept in captivity for two months near Box Hill freely ate insects and bread crumbs. The male camps at night in the lower portions of the trees adjacent to the nest, as also does the family, subsequently, for some weeks. How many is not certain, and it probably depends on how many broods and the time of the season with which they may be concerned. The Box Hill birds are away from the parents by January, and the Heytesbury ones by January or February, accordingly as the

brood may be early or late; in addition, the heavy part of the latter district is colder than the former, and the breeding season is slightly delayed and extended. After January the adults go in pairs for a time, each couple keeping to its special hunting ground. A few weeks later they are gregarious in their habits. Mr. Graham has noticed that all keep well under green shelter during the heat of the day, and visit the open during the early morn or on dull or stormy days. The young males assume a general likeness to the adult male parent during the following February or March, but not before the third year are they quite like each other, the red varying in intensity to a marked degree, just as that of *P. phænicea*, Gld. Like the latter species, it moults its red in immediate favour of a fresh supply, so that a Robin once red is always red.

NOTES ON SOME DESERT BIRDS.

By G. A. KEARTLAND.

(Read before the Field Naturalists' Club of Victoria, 14th Jan., 1901.)

IN alluding to the birds of the great central desert of Australia it is not my intention to refer to the Raptores, which possess sufficient wing power to travel from the centre of the widest part of the Great Desert to its margin in a few hours, but to those less fitted by nature for sustained flight. The latter may be divided into two classes—those which are indicative of the presence of water, and those which appear to be quite regardless of its existence.

First of all let me say that the great central desert of Australia covers an area of about 320,000 square miles, extending from Sturt's Creek in the north to the Musgrave Range in the south, and from Lake Augusta in the west to the overland telegraph line in the east, which, with the exception of a comparatively small area of pastoral country along the course of the Finke River and in the western valleys of the Macdonnell Ranges, is simply a barren waste of sand clothed with spinifex, and crossed diagonally by numerous sandhills, which run from N.W. to S.E.

Amongst the birds which indicate the proximity of water we find the graminivorous birds, such as pigeons and parrots, which always require a drink to soften the seeds swallowed before they are passed into the stomach and digested; whilst the *Amytis*, *Calamanthus*, and *Stipiturus* have such short wings as to be incapable of flying any great distance. Yet these three species are found in the most arid portions of the desert, where no indications of water exist. They are insectivorous, and doubtless extract sufficient moisture from the food upon which they subsist.

By a study of the habits of the avifauna of a country the

traveller may often spare himself a large amount of inconvenience, and sometimes overcome serious difficulties. Thus, about an hour after sunrise, and again at sunset, flocks of Rose-breasted Cockatoos, *Cacatua roseicapilla*, Leadbeater's Cockatoo, *C. leadbeateri*, followed by the Bronzewing Pigeon, *Phaps chalcoptera*, travelling in one direction indicate that by following the same course water may be found, but often at too great a distance to reach. It is different, however, with the Crested Bronzewing Pigeon, *Ocyphaps lophotes*, and Chestnut-eared Finch, *Tanipygia castanotis*, or Little Turtle Dove, *Geopelia cuneata*, which are seldom more than a few miles from some native well or rockhole, and can often be followed to their watering place. On the other hand, the Striated Wren, *Amytis striatus*, and Emu Wren, *Stipiturus malachurus*, are found enjoying life, singing and breeding, where no other form of bird life exists, deriving their sustenance from the spiders, bees, and ants which abound amongst the spinifex grass, *Triodia irritans*.

As some of the birds mentioned are also found in more hospitable regions, perhaps it will be acceptable to furnish a short note on some of the species found in the desert, and such peculiarities as attracted notice, beginning with those which select the dry country.

1. SPOTTED NIGHTJAR, *Eurostopodus argus*.—Across the whole of tropical Australia the singular notes of these birds may be heard soon after nightfall, and immediately a fire is started they come circling round in pursuit of the numerous Coleoptera attracted by the light, but retire to the rocky hills to pass the day on the ground, where they also breed, laying a single egg, but making no nest. Owing to the expanse of their wings and their small bodies they fly for hours without fatigue.

2. STRIATED WREN, *Amytis striatus*.—Owing to the extreme shyness of this wren, and its activity in running between the spinifex tussocks it is impossible to learn much of its economy without shooting the bird, which is no simple matter. Although furnished with short, rounded wings they possess very strongly developed legs, and carry as much flesh on the thighs as on the breast. During September and October, 1896, I found many of their nests, containing either eggs or young, at least 100 miles from the nearest known water, in country too dry for either the native or dingo to exist. The nests were built of grass strippings, somewhat similarly to those of the Maluri, but with very large openings, always facing the east, and placed on top of a spinifex tussock. When the nest was approached the bird simply jumped to the ground and ran off. The two white eggs are sparingly sprinkled with light brown spots. Although during the Horn Scientific and Calvert Exploring expeditions I observed hundreds of these birds I never saw one fly a hundred yards.

3. TEXTILE WREN, *Amytis textilis*.—Differing but slightly from the foregoing species in structure and plumage, the Textile Wren is generally seen in country containing low stunted herbage, saltbush or samphire, in addition to spinifex. Its low, squeaking note is first heard, and the bird dislodged by kicking the bush, when it runs off to the nearest shelter. When undisturbed they occasionally perch on a low bush and indulge in a very pretty song. Their nests are placed beside a tussock or low bush, and contain two white eggs, closely spotted with red, almost obscuring the ground colour at the large end. Although I have found these birds near water they are quite as numerous far from it.

4. EMU WREN, *Stipiturus malachurus*.—Endowed with very short, round wings, these diminutive birds were found in the spinifex in the centre of the desert. Owing to their dodging like mice from tussock to tussock it was impossible to shoot them, and specimens were secured by covering the tussock with a canvas sheet and then extracting the bird. Their nests were placed on the side of the spinifex. As the specimens obtained were all lost, there may be some doubt as to the identity of this bird, owing to the fact that the males were somewhat brighter coloured on the throat, and the barbs of the tail feathers were closer and more compact, than those of birds found in the moist localities which they usually frequent.

5. TRICOLORED EPHTHIANURA, *E. tricolor*.—Whilst only isolated birds of this species were seen during the hottest weather, in the months of July and August large flocks of both old and young were passed far from any known water. Those noted in October were the only birds seen, except the Oreoica, for several days.

6. ALEXANDRA PARRAKEET, *Spathopterus alexandrae*.—Few birds have been the subjects of more interest than this species. When first discovered by Mr. Waterhouse at Howell Ponds, Northern Territory, about forty years ago, some ornithologists were of opinion that the specimens were simply hybrids; but the illusion was soon dispelled, as subsequent birds were obtained by Dr. Stirling and others. On 16th June, 1894, I found many of these beautiful parrakeets scattered about in small flocks in desert oaks or amongst the spinifex, near Glen Edith, in Central Australia, and again in September, 1896, I saw them in pairs or small flocks in the desert of North-West Australia. They were always seen in the most inhospitable country it is possible to conceive, either flying slowly, as if distressed, or feeding amongst the spinifex, the seeds of which form their chief food. Although camped for a week at a well where thousands of other birds came to drink, the Alexandra Parrakeet, which had been seen about twenty miles away, did not come near. It is doubtless owing to the desolate nature of the country which they inhabit that so few

specimens are obtained. On one occasion—November, 1894—they bred in large numbers on the Hale and Hugh Rivers, in Central Australia, although residents of that neighbourhood for over thirty years had not seen them before, nor have they repeated the visit. Whilst in a state of nature they appear to subsist on very little water. In captivity they drink freely and often.

7. SWIFT-FLYING TURNIX, *Turnix velox*.—Throughout the whole route of the Calvert Exploring Expedition, from Cue to the Fitzroy River, in North-West Australia, but few days passed without our disturbing numbers of these birds. It mattered not what the country was like—dry spinifex flats, gullies clothed with kangaroo grass, or the Flinders and Mitchell grass plains near the river—the Turnix was everywhere. They were just as numerous far from water as near the wells, and although most other birds came to drink the Turnix was not known to do so.

But the birds which are of most interest to the traveller are those which are valuable either as water guides or for culinary purposes. Foremost of these is the

8. CRESTED BRONZEWING PIGEON, *Ocyphaps lophotes*.—Wherever water exists in the desert, even in small quantities, these birds are certain to be found. As they resort to their drinking places morning and evening they are comparatively easy to follow. They generally travel in flocks, and fly from tree to tree one after another, the last bird seldom leaving its tree until several of its predecessors are again perched. This processional style of flight is repeated until the water is reached, and after quenching their thirst the Pigeons remain in the neighbourhood for some hours. As they assemble in a compact flock on the margin of the well, preening their feathers, many birds may be killed at a single shot, or they can be snared with horsehair and string. On several occasions members of the Calvert Expedition killed as many as 30 pigeons in a few shots. Their bodies are very plump and of excellent flavour (especially after a few weeks on tinned meat). Through watching and following the Crested Pigeons Mr. Wells found water on two or three occasions when it was sadly wanted.

9. BRONZEWING PIGEON, *Phaps chalcoptera*.—Although this pigeon is found in almost every part of the continent, it is most numerous in the sandy wastes of the tropics, where it finds an abundance of seeds of various kinds, and enjoys immunity from many of those enemies which threaten its existence in more favoured localities. Their powerful wings carry them so far in such a short space of time that it is not unusual for them to travel thirty or forty miles to water and afterwards return to their feeding grounds. They generally time their journey so as to arrive at the water between sunset and dark, alighting on the ground with a heavy thump, and, after awaiting the arrival of

several companions, they march in single file to drink. They afterwards depart, singly or in pairs, as they arrived. The question as to whether they can scent water or are endowed with nocturnal vision is an interesting one. I have frequently heard them arriving at and departing from water as late as 9 p.m., *i.e.*, two hours after dark. During the visit of the Horn Scientific Expedition to the West Macdonnell Ranges, Central Australia, a well was sunk in the sand by lamplight, and it was nearly 9 o'clock when water was reached, but before it was sufficiently light to shoot on the following morning one of the natives accompanying the party killed a Bronzewing Pigeon with a stone as it approached the well. At Joanna Spring I saw as many as forty pigeons on the ground near the water at one time, and as they drank they flew off for some distance, and afterwards returned for another drink. It will thus be noted that the flight of successive birds in a given direction about sunset is a good indication of the direction in which the water exists.

10. CHESTNUT-EARED FINCH, *Taeniopygia castanotis*.—I suppose it would be impossible to name a bird which consumes so much water in proportion to its size as this finch. Wherever water was found in the desert of either Central or North-West Australia these birds were seen in immense flocks, and the more isolated the water the more numerous the birds. I only saw one flock over 8 miles from water. They were very thirsty and tired, and settled on the tree under which we were having lunch, about 15 miles west of Joanna Spring. The billy was boiling on the fire, and the finches flew to the water casks, and, after hopping about them for some minutes, returned to the tree. Immediately a pannikin of water was placed on the ground they drank ravenously, and then started off in the direction of a well which we afterwards found. What attracted those birds to that particular tree when there were many others near? It must have been either the sight of the water in the billy, or the scent of the contents of the casks.

11. LITTLE TURTLE DOVE, *Geopelia cuneata*.—Although never found far from water, these birds are so quick in their movements that it is almost impossible to follow them. They do not venture further from their water supply than the search for food necessitates, and whilst they both feed and drink in flocks, when disturbed they scatter in all directions, reassembling shortly afterwards as if by pre-arrangement. However, the presence of these doves is an indication that water is not far distant, and when they are seen a sharp look-out generally reveals the presence of the Crested Pigeon or Chestnut-eared Finch.

12. WARBLING GRASS PARRAKEET, *Melopsittacus undulatus*.—The flight of large flocks of these little Parrakeets about 9 a.m. or 4 p.m. is also worthy of observation, as they are usually on their way to water at that time, but their flight is too rapid for any

purpose beyond taking bearings. However, as their course is generally a direct one it is worth noting. They are great drinkers, and, once arrived at the water, remain in its vicinity for some hours.

Amongst the other birds found in the desert were the Field Calamanthus, *Calamanthus campestris*; Crested Oreoica, *O. cristata*, whose nests in the stunted trees were frequently passed; Pallid Cuckoo, *Cacomantis pallidus*; White-breasted Swallow, *Cheramæca leucosternum*, with young scarcely able to fly, on 6th October; Masked Wood-Swallow, *Artamus personatus*, in large flocks; Black-faced Wood-Swallow, *Artamus melanops*; Chestnut-backed Thrush, *Cinclosoma castanonotum*; Cinnamon Thrush, *Cinclosoma cinnamomeum*; Swallow Dicæum, *Dicæum hirundinaceum*; and Western Ground-Parrakeet, *Geopsittacus occidentalis*. The following Honey-eaters were also obtained in mallee or mulga scrubs passed through, or on the Acacias which capped the sandhills:—White-eared Honey-eater, *Ptilotis leucotis*; Singing, *P. sonora*; Keartland's, *P. keartlandi*; Pied, *Certhionyx leucomelas*; Black, *Myzomela nigra*; and Yellow-throated Minah, *Myzantha flavigula*.

AUSTRALIAN ETHNOLOGY.—It is expected that Professor Spencer, F.R.S., of the Melbourne University, and Mr. F. J. Gillen, of South Australia, will start from Oodnadatta, the present terminus of the transcontinental railway, nearly 700 miles north of Adelaide, on their expedition for the purpose of studying the habits and customs of the aboriginals of the northern portion of Central Australia, about the middle of the present month. The start has been somewhat delayed owing to the fearful drought which has existed for some time in the portion of the continent to be visited. They also propose to cross into Queensland, and continue Dr. Roth's ethnological work, and afterwards traverse some of the larger rivers of the Northern Territory, and if time permit visit the Wyndham district on Cambridge Gulf in North-West Australia.

THE MUELLER MEMORIAL FUND.—It has been decided that the National Fund raised in memory of the late Baron von Mueller, Government Botanist of Victoria, shall be devoted to the institution of a medal and prize to be awarded at intervals of not less than two years to the author of the most important contribution to natural knowledge which shall have been published in the British dominions not more than five years or less than one year prior to the date of the award, preference being given to work having special reference to Australasia. It is proposed that the Mueller Medal shall be awarded by a committee of the Australasian Association for the Advancement of Science appointed for the purpose every two years.

Field Naturalists' Club of Victoria.

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MR. J. A. KERSHAW, F.E.S., and MR. D. Le SOUEF, C.M.Z.S.

* OBJECTS. *

THIS CLUB was founded in 1880 for the purpose of affording observers and lovers of Natural History regular and frequent opportunities for discussing those special subjects in which they are mutually interested; for the exhibition of Specimens; and for promoting Observations in the Field by means of Excursions to various collecting grounds around the Metropolis.

SUBSCRIPTIONS.

As the Club's year is drawing to a close, members who have not already paid their subscriptions will oblige by forwarding the same to the Hon. Treasurer as early as possible.

THE VICTORIAN NATURALIST

*Contains the proceedings of the Field Naturalists' Club
of Victoria.*

Authors of Papers published in the *Victorian Naturalist* are informed that reprints of such articles can be obtained at a nominal cost by giving notice previous to publication to the Hon. Sec., from whom all information can be obtained.

MOST of the Numbers from the commencement, January, 1884, can be obtained from the Hon. Sec., Mr. Geo. Coghill, 80 Swanston Street, Melbourne, at Sixpence each, or in sets (except Vols. I. and IV.), with title page and index, 6/- per volume.

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VOL. XVII.—No. 12.

APRIL, 1901.

The Victorian Naturalist :

THE JOURNAL AND MAGAZINE

— OF —

The Field Naturalists' Club of Victoria.

PUBLISHED 4th APRIL, 1901.

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The Author of each article is responsible for the facts and opinions recorded.

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1901.

Field Naturalists' Club of Victoria.

ROOMS—ROYAL SOCIETY'S HALL, VICTORIA ST., MELBOURNE.

BUSINESS PAPER FOR MONTHLY MEETING.

Monday, 15th April, 1901, at Eight p.m.

1. Correspondence and Reports.

2. Election of Members.

	Proposer.	Seconder.
Mr. G. B. Pritchard Mantell St., Moonee Ponds	T. S. Hall, M.A.	F. E. Grant
AS COUNTRY MEMBER—		
Mr. Jos. A. Hill Kewell	Jas. A. Kershaw	Geo. Coghill

3. Nominations for Membership.

Members making nominations will oblige by handing the full name and address to Hon. Secretary.

4. General Business.

5. Reading of Papers and Discussions thereon.

(Authors are requested to hand in a brief resume of their papers to the Secretary.)

- 1 By Mr. J. F. Haase, "Notes on Collecting Lepidoptera."
- 2 By Mr. R. Hall, "Descriptions of Young of Some Australian Birds."
- 3 By Mr. T. S. Hall, M.A., "On Certain Incrustations in Dune Sand."

6. Reading of Natural History Notes.

Members who may note any unusual occurrence, or see anything of interest in Foreign or Colonial papers, are requested to inform the Secretary of the same that he may arrange for their bringing them before the meeting; such notes should, however, be brief.

7. Exhibition of Specimens and Conversazione.

Members exhibiting specimens are requested to furnish the Hon. Secretary with written particulars of their Exhibits for record in Minutes and *Naturalist*.

* EXCURSIONS. *

SATURDAY, 13TH APRIL.—Geological Dept. Leader, Professor J. W. Gregory, D.Sc. Meet at University Quadrangle, 2.30 p.m. Geology.

SATURDAY, 27TH APRIL.—Entomological Dept. Leader, Mr. C. French, F.L.S. Meet there (Lonsdale Street), 2.30 p.m. Entomology.

THE
Victorian Naturalist.

VOL. XVII.—No. 12. APRIL 4, 1901.

No. 208.

FIELD NATURALISTS' CLUB OF VICTORIA.

THE ordinary monthly meeting of the Club was held in the Royal Society's Hall on Monday evening, 11th March, 1901. The president, Mr. J. Shephard, occupied the chair, and about 45 members and visitors were present.

REPORTS.

A report of the excursion to Beaumaris on Saturday, 16th February, 1901, was given by Mr. O. A. Sayce, who said that an enjoyable afternoon had been spent, and a large number of objects, principally Crustacea, collected.

The hon. librarian reported the receipt of the following donations to the library :—"Annual Report, Department of Agriculture, Victoria, 1900," from the Department ; "Proceedings Royal Society of Victoria," vol. xiii., part 2, from the Society ; "Proceedings Royal Geographical Society of Australasia (Victorian Branch)," vol. xviii., part 2, 1900, from the Society ; "A New Species of Blue Wren from King Island," by A. J. Campbell (reprint from *Ibis*), from the author ; *Queensland Agricultural Journal*, vol. viii., parts 1 and 2, from Department of Agriculture, Brisbane ; *Nature Notes*, January, from the Selborne Society, London ; *Knowledge*, January and February, 1901, from the proprietor ; and *Science Gossip*, January, from the proprietor.

ELECTION OF MEMBERS.

On a ballot being taken, Messrs. Cuthbert C. Wallis, Toorak-road, Toorak, and J. Fullard, Lyndhurst-crescent, Hawthorn, were duly elected members of the Club.

GENERAL BUSINESS.

On the motion of Mr. A. J. Campbell, it was resolved—"That the Secretary write to the Rutherglen Shire Council, supporting the members who wish to keep the Lake Moodemere reserve closed against the destruction of birds, and to the same effect to the Minister of Lands." This was supported by Messrs. Coles, Best, Pitcher, the president, and others.

Mr. G. A. Kearthland again this season drew attention to the too early opening of the Quail-shooting season, and moved—"That the Secretary write to the Minister of Lands, drawing his attention to the opening of the Quail season while the birds were

still breeding or with chicks, the time being in the opinion of the Club one month too soon." Seconded by Mr. A. Mattingley and carried.

PAPERS READ.

1. By Mr. J. A. Kershaw, F.E.S., entitled "Notes on a Rare Victorian Moth, *Mochlotona phasmatis*, Meyr."

The author gave descriptions of the male and larva of this rare moth, the female having been described by Meyrick in 1891 from a specimen taken at Warragul, Gippsland.

2. By Mr. A. J. Campbell entitled "Description of a New Wren, *Malurus edouardi*."

The author described a new Wren recently obtained in Western Australia as *Malurus edouardi* to be known as the Black and White Wren, and is the only pied species of the genus found in Australia.

3. By Dr. W. Macgillivray, entitled "Some North-West Queensland Birds."

The author gave an interesting series of notes on the birds found in the vicinity of Cloncurry, in the Gulf District of Queensland.

The paper caused considerable discussion, in which Messrs. Keartland, Anderson, Coles, and Campbell joined.

4. By Mr. D. Best, entitled "A Trip to the Mallee and the Grampians."

The author graphically described a recent collecting trip to the Mallee near Rainbow, also near Dimboola, and finally to the Grampians *via* Stawell, recording a number of interesting insects and plants met with.

EXHIBITS.

By Mr. E. Anderson.—Emerald Moth, *Iodi externa*, Walk., new to Victoria.

By Messrs. D. Best and C. French, jun.—Beetles collected in the Mallee and the Grampians.

By Mr. A. J. Campbell, on behalf of Mr. B. H. Woodward, F.G.S., Curator, Perth Museum.—Three skins of a new Wren from Barrow Island, North-West Australia, described as *Malurus edouardi*, Campbell, in illustration of paper.

By Mr. C. French, jun.—Timber specimen of *Eucalyptus stuartiana*, showing ravages caused by longicorn beetles, *Cnemoplites edulus*, from Gembrook, Vic.; also *Calocasia macrorrhiza*, flower of aroid, of New South Wales and Queensland.

By Mr. F. E. Grant.—Crabs, &c., from Beaumaris, including *Pilumnus monilifer*, Haswell; *Litocheira bispinosa*, Kin.; *Nectocarcinus tuberculosus*, M.-Edw.; *Heterograpsus octodentatus*, M.-Edw.; *Utica crassimana*, Has.; *Chasmagnathus levis*, Dana; *Cryptodromia lateralis*, Gray; and *Dromia ciliata*, Henderson.

By Mr. J. A. Kershaw, F.E.S.—Rare Victorian Moth, *Mochlostona phasmatias*, Meyr., in illustration of paper.

By Mr. C. Walter.—Plants new for Victoria. *Epaltes tatei*, F. v. M., Wimmera district, collected by Mr. St. Eloy D'Alton, Dimboola; *Aizoon zygophylloides*, F. v. M., Geelong district, collected by Mr. Ed. E. Pescott; and *Mitrasacme pilosa*, Labill., East Gippsland (new locality), collected by Mr. Ed. E. Pescott, Orbost.

By Mr. H. W. Whitney.—Nest of the Red-browed Finch, *Aegintha temporalis*, Lath., from Healesville.

After the usual conversazione the meeting terminated.

DESCRIPTION OF A NEW WREN OR MALURUS.

By A. J. CAMPBELL.

(Read before the Field Naturalists' Club of Victoria, 11th March, 1901.)

THE discovery of a black and white *Malurus* for Australia is an item of considerable interest to ornithologists. The only other pied species of this genus, *M. albiscapulatus*, Meyer, is found in New Guinea, from which the Australian species differs in having the upper wing coverts and inner secondaries, in addition to the scapulars, white.

For the new bird I beg to propose the name *Malurus edouardi*, in honour of our new monarch, His Majesty King Edward VII., this being the first Australian bird discovered during his reign. Moreover the royal family have always evinced a great interest in natural history. The bird will be known on the Vernacular List as the "Black and White Wren."

This new Wren was the discovery of the collector of the Perth Museum, and was procured amongst spinifex grass on Barrow Island, off the north-western coast of Australia, during December, 1900. Through the courtesy of Mr. Bernard Woodward, F.G.S., the curator, three specimens are exhibited here to-night, and I have to express my indebtedness to him for kindly permitting me to record their descriptions, which are as follow:—

(1) An adult male. General colour glossy blue-black; wings brownish, the primaries being edged with blue-black; side of upper breast, scapulars, inner secondaries, and upper wing coverts pure white; irides, bill, and tarsi black.

(2) Male, young, or in seasonal change. Feathers of the wing coverts and secondaries are partly brownish and partly white.

(3) Immature male. The greater portion of the wing coverts is brownish-white. The black under surface of the body is curiously mottled with white.

The female, judging by analogy, will no doubt be brownish,

paler on the underneath part, but having regard to its environments it will probably be more rusty-coloured than the females of the other known members of its genus.

Dimensions in inches :—

	Length.		Culmen.		Wing.		Tail.		Tarsus.
(1)	4.5	...	.35	...	1.8	...	2.0	...	.75
(2)	4.5	...	.35	...	1.75	...	2.05	...	.75
(3)	4.75	...	.35	...	1.8	...	2.2	...	.75

NOTES ON A RARE VICTORIAN MOTH, *MOCHLOTONA PHASMATIAS*, MEYR.

BY JAS. A. KERSHAW, F.E.S.

(Read before the *Field Naturalists' Club of Victoria*, 11th March, 1901.)

THIS species, which is one of the rarest of our Geometers, and is included in the family Selidosemidæ, was described by Mr. E. Meyrick, F.E.S., in the Proc. Linn. Soc. N.S.W., p. 673, 1891, from a single specimen collected by Dr. T. P. Lucas at Warragul, Gippsland, Victoria.

Owing to the marked difference in neuration from its nearest allies, Mr. Meyrick decided to form a new genus for its reception, and up to the present time this is the only species known.

Although fully ten years have elapsed since the first specimen was taken, I do not know of any other specimens having been collected, excepting those taken by myself some years ago at Narracan, Gippsland, and a single specimen which I recently saw in the collection at the Australian Museum, Sydney, and which was taken at Warra, New South Wales.

On two or three occasions when collecting in Gippsland I was fortunate not only in capturing several fine specimens, but in taking a single larva from which I successfully reared a male. The specimen described by Meyrick was unfortunately a female, so that he was unable to give one or two important characters only found in the male. These I am now able to supply, and as my specimens differ somewhat from the description given by Meyrick, besides in two or three instances showing considerable variation both in markings and extent of colouring in both upper and lower wings, I have thought it desirable to give a full description of both the typical form and the variety. In addition I give a detailed description of the larva and pupa.

Examples of the specimens here described have been placed in the collection of the National Museum, Melbourne.

In justice to Mr. Meyrick I must state that on forwarding a specimen to him he readily identified it as the male of his type, and it is partly at his suggestion that I give the following details.

Male.—56 mm. Head and thorax greyish with a few black

scales, the thorax not crested. Palpi blackish above, beneath white. Antennæ simple, filiform, grey, beneath reddish. Abdomen greyish white, with scattered black scales. Fore-wings very elongate-triangular, hind-margin somewhat obliquely rounded, slightly waved; white, with scattered black and fuscous scales, more numerous towards costa. A small reddish-ochreous elongate discal spot. A short sub-basal interrupted line from costa to just below median nervure, usually only indicated by a blackish spot at base of costa, and another immediately below median nervure. Two reddish-ochreous transverse lines, first from $\frac{1}{4}$ of costa to $\frac{2}{5}$ of inner margin, twice outwardly curved, almost dentate; second from rather more than $\frac{2}{3}$ of costa to the same of inner margin, inwardly curved below middle, sharply dentate on upper $\frac{2}{3}$. Beyond this are two reddish-ochreous suffused patches, one about middle, and the other towards anal angle, usually indicated by clusters of three or four spots; a terminal series of blackish semilunate marks; cilia white, sometimes tipped with reddish-ochreous between veins.

Hind-wings with hind-margin unevenly rounded, rather sinuate about middle, dark grey, with a very broad blackish hind-marginal band and small discal spot; cilia dark grey, tipped with white.

Female.—63 mm. Similar to above, with the following exceptions:—A broad median transverse reddish-ochreous suffusion occupying the space between the first and second lines, but not reaching costa, and extending along inner margin towards base. Abdomen with dorsal surface of the second to fourth segments dark grey.

Var. A.—Male.—52 mm. Resembling the female, though darker generally, the median band being fuscous, dark grey on costa and reddish-ochreous at base.

Hind-wings with broad hind-marginal band more suffused, the anterior margin not clearly defined, but gradually blending with the dark grey of basal half. Abdomen above dark grey, except basal segment and anal tuft, which are whitish, beneath white.

Larva.—Bright green, darker above, and ornamented with fine white and yellow markings, those towards the dorsal surface forming interrupted white longitudinal wavy lines, and on the sides small scattered yellowish spots. A lateral series of larger yellowish elongate spots on each of the fifth to the last segments; ventral surface very pale greenish white. Each segment is furnished with several small conical spiny projections, with two longer black ones on the fifth, rather more in length than the diameter of the body, and ornamented with minute white dots, and a shorter conical one, bifid for about half its length, on the eleventh segment. A dorsal series of broad black patches orna-

mented with fine white hair-like markings on the anterior portion of each segment. Head black, with minute white spots; crown slightly depressed, face reddish-brown.

Four pairs of prolegs, the last two pairs being rudimentary.

Length, 1 inch 3 lines. Food, *Acacia dealbata*.

Changed into pupa slightly under surface of ground early in May, the imago appearing at the end of the following January.

Pupa dark brown, shining, the last segment pointed and furnished with two minute hooks. Length, 10 lines.

BOOK NOTICE.

NESTS AND EGGS OF AUSTRALIAN BIRDS. By A. J. Campbell.

Printed for the author. Pawson and Brailsford, Sheffield, England.

AT length we are able to congratulate our fellow-member, Mr. A. J. Campbell, on the completion of his self-imposed task, and the production of a valuable addition to the natural history literature of Australia. The work under review forms a somewhat bulky volume, containing nearly 1,100 pages of letterpress in addition to preface, indexes, &c. The author has dedicated the volume "to the memory of the two G.'s"—John Gould and John Gilbert—men who did giants' work in Australian ornithology during the first half of the last century. The introduction, of thirteen pages, is devoted to a brief sketch of the work done in Australian ornithology and oology up to the present day. This is followed by a systematic index of twenty pages, in which, as all through the volume, the vernacular name occupies the first place, so that would-be readers need not be deterred from its perusal by any formidable Latin names. A map of Australia follows. This would have been more interesting had the author's tracks from Melbourne in the south to Trinity Bay in the north, and westerly to the Abrolhos Islands, off the coast of Western Australia, including Tasmania and the islands of Bass Straits, been indicated upon it, thus showing that so much of Mr. Campbell's information is the result of personal observations in the field. The main portion of the work consists of over 1,000 octavo pages, not one of which can in any sense be termed dry. He enumerates 765 birds, but is obliged to leave the nests and eggs of nearly 100 "undescribed," so that Australian oologists have still some work to do. After the name of the bird, which bears Gould's reference number, is given the reference to the figure of the bird, the description in the "British Museum Catalogue," and to previous descriptions of the eggs. Then follows the geographical distribution, by political not faunal areas, description of nest, description of eggs, and, finally, observations. These latter are written in a very popular style, and vary from a few

sentences to several pages, recounting various interesting features connected with the habits of the birds, incidents in the taking of the eggs, and other circumstances, in which the names of many members of the Field Naturalists' Club of Victoria will be found. Particularly interesting to the early pioneers of the Club will be found the observations on page 400. These pages are well illustrated with about 130 excellent reproductions of photographs of nests, &c., a great many of which also testify to the author's skill and perseverance in procuring them. Where all are so good it is difficult to call attention to particular plates, but non-Australians should be interested by such a charming picture as "The Haunt of the Lyre-bird," while such plates as "The Nest of the White-bellied Sea-Eagle," or "The Nest of the Wood Duck," demonstrate some of the difficulties of the egg-collector. The pretty Rose-breasted Robin, one of our Victorian rarities, is the only bird figured, and it is honoured with a coloured plate from the brush of Mr. C. C. Brittlebank, whose artistic and natural history accomplishments have often been referred to in these pages. Mr. Brittlebank is also responsible for the drawing and colouring of twenty-six plates of eggs, containing representations of about 200 rare or typical Australian specimens, which have been so well reproduced by the mechanical skill of the printers as to bear very critical comparison with the originals in the author's collection. A short appendix, which includes information published in the September issue of this journal, brings the bird notes quite up to date, while a very complete index of vernacular names, filling more than seventeen double-column pages, completes the volume. The space at our disposal prevents any quotation from the work, which is one which should be found in every public library of any pretension throughout Australia. Its production has necessarily cost a large sum, and, though a large number of copies were guaranteed, the author is still dependent upon a generous public to recompense him for his monetary outlay. However, we feel sure the general verdict of satisfaction with which the volume will be received will to some extent compensate him for having spent the spare time of ten years in securing his illustrations, and of the last seven years in preparing his notes for publication. The get-up of the work leaves nothing to be desired, except that had it been issued in two volumes it would have been handier for use, but this, doubtless, would have increased the price, which to original subscribers has been fixed at fifty shillings, while to future purchasers the price will be three guineas.

AUSTRALIAN ORNITHOLOGY.—At the November dinner and meeting of the British Ornithologists' Club of London, the chairman, Dr. P. L. Sclater, F.R.S., delivered the annual address, in

which he referred to the various countries where work among birds still remained to be done, and in speaking of the Australian region said that, as Gould's Handbook was published in 1865, it was quite time to have a new work on the subject ; and in a later letter to Mr. D. Le Souëf he says that the establishment of an Ornithological Union in Australia is a step in the right direction, and the preparation of a new "Handbook of the Birds of Australia" would be a fine subject for the Australian Ornithologists' Union to take up.

VICTORIAN GEOLOGY.—We are pleased to record that the work done in Victorian geology by Mr. T. S. Hall, M.A., assistant lecturer in Biology at the Melbourne University, and one of the vice-presidents of the Field Naturalists' Club of Victoria, has been recognized by the Geological Society of London by the award to him of the prize known as the Murchison Fund.

FEROCITY OF MAGPIES WHEN NESTING.—A note by Mr. C. French, jun., on this subject appeared in the November number of the *Victorian Naturalist*. When at Warracknabeal I knew of many magpie nests in the Mallee, and yet only two of the birds attacked passers-by—one especially being very fierce. This one had been robbed of its eggs in 1894, and the eggs were shown me in the following season by the boy who had taken them from this particular bird. Another magpie nesting in 1896 quite near this one was not known to molest anybody. In the Orbost district, East Gippsland, I have been daily attacked, during two seasons (1899–1900), by two magpies, nests distant about a mile from each other. While there are many other magpies nesting near these two, they have not been known, so far as I can ascertain, to attack anyone. In this case, as in the other, I know well the boys who had previously robbed these two birds of their eggs. These observations, I think, help to bear out the conclusion arrived at by Mr. French, viz., that magpies develop their ferocity and combativeness only after having been robbed of their eggs.—ED. E. PESCOTT, Orbost, Gippsland.

SOUTH AUSTRALIAN ORNITHOLOGICAL ASSOCIATION. — The second annual meeting of this Association was held in Adelaide on 1st March, when the president, Dr. Morgan, occupied the chair. The hon. secretary, Mr. J. W. Mellor, read the annual report, which showed that a considerable amount of work had been done during the year. The Association had greatly helped the passing of a new Act of Parliament for the better protection of the useful native birds ; while at the evening meetings many interesting subjects had been discussed and specimens exhibited. Mr. A. H. C. Zeitz was elected president, Mr. M. Symonds Clark vice-president, and Mr. J. W. Mellor hon. treasurer and secretary for the ensuing year.

Field Naturalists' Club of Victoria.

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* OBJECTS. *

THIS CLUB was founded in 1880 for the purpose of affording observers and lovers of Natural History regular and frequent opportunities for discussing those special subjects in which they are mutually interested; for the exhibition of Specimens; and for promoting Observations in the Field by means of Excursions to various collecting grounds around the Metropolis.

SUBSCRIPTIONS.

As the Club's year is drawing to a close, members who have not already paid their subscriptions will oblige by forwarding the same to the Hon. Treasurer as early as possible.

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